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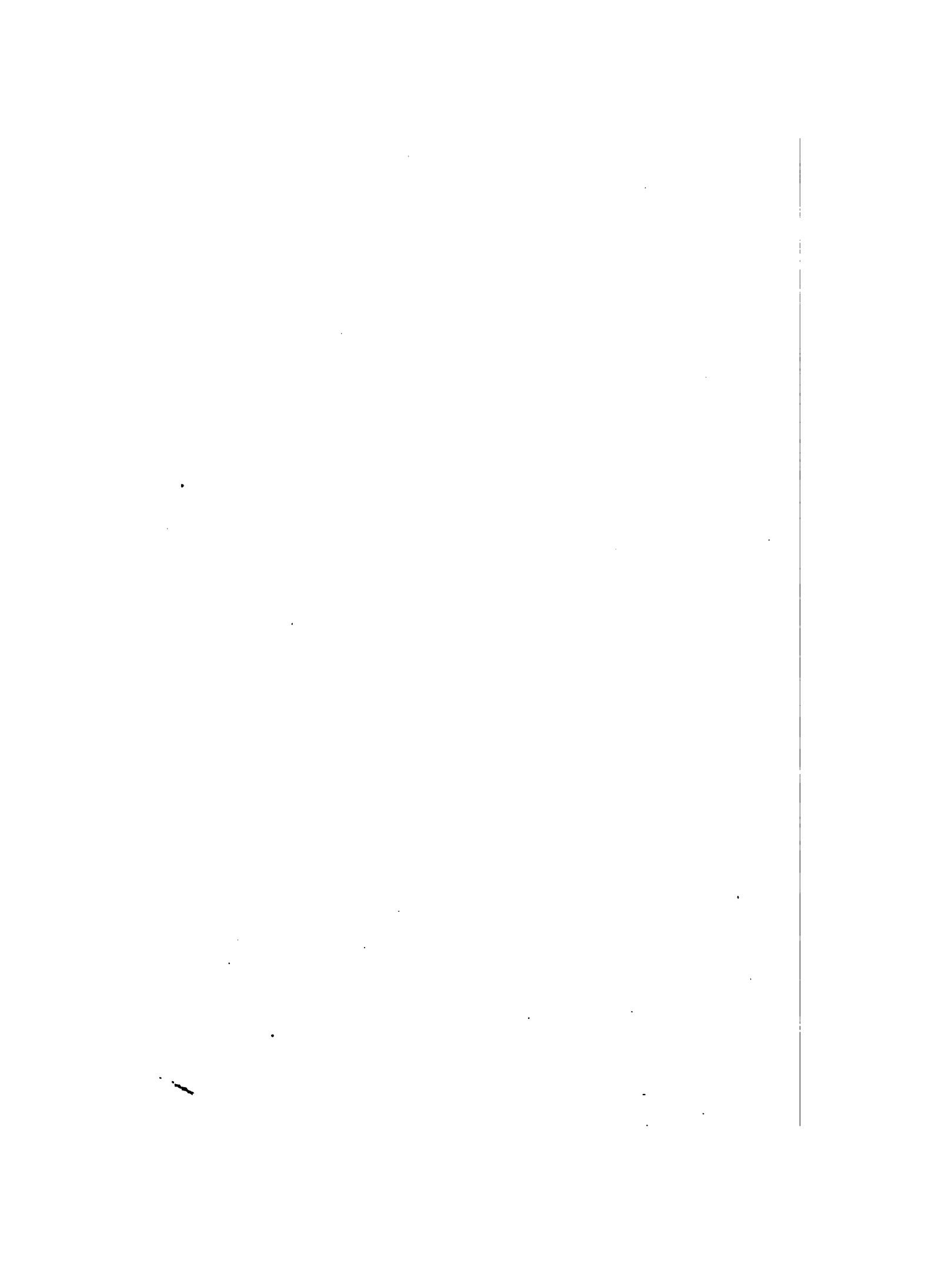
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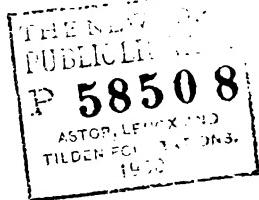
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ELECTRIC LIGHTING

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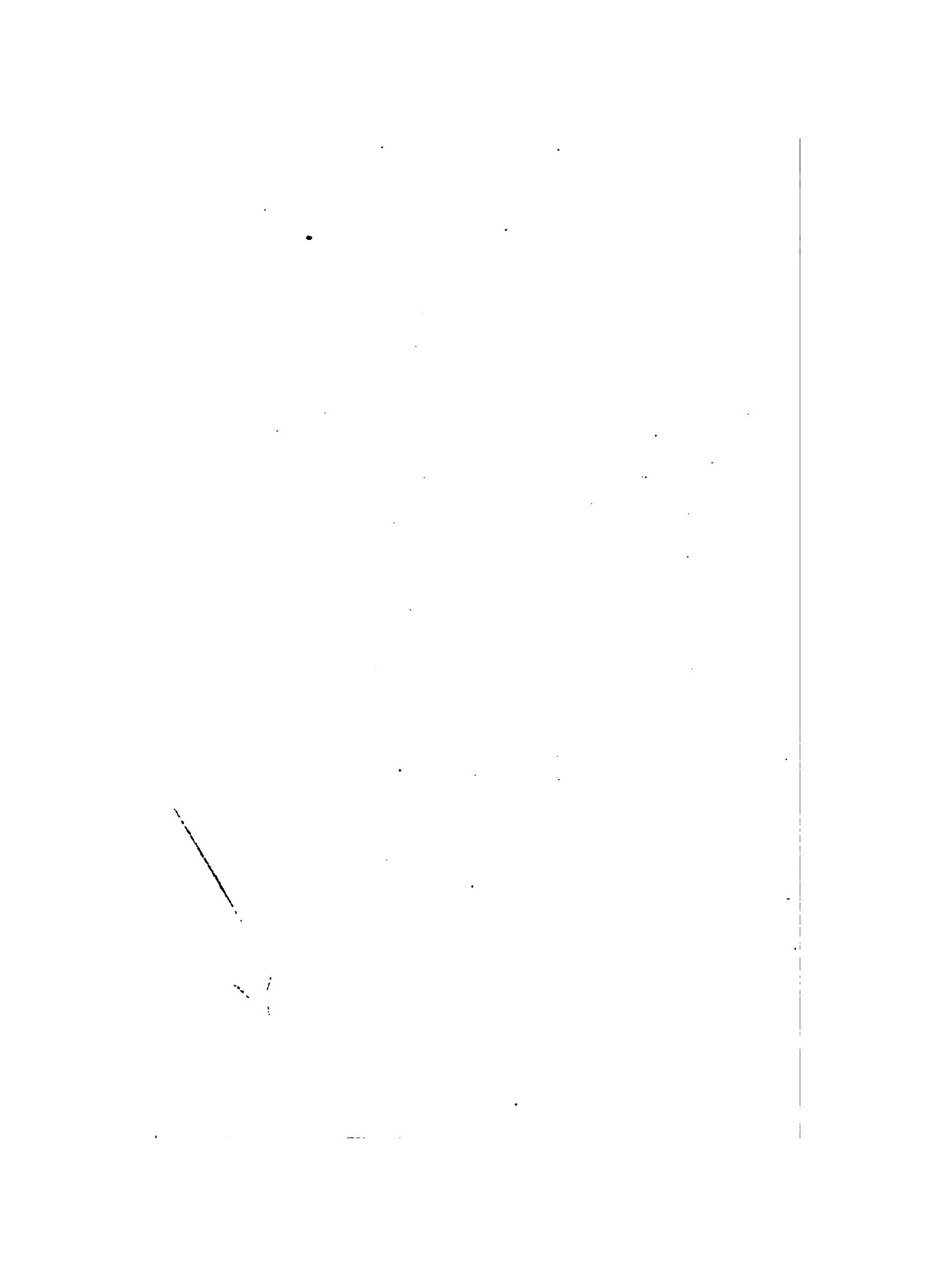
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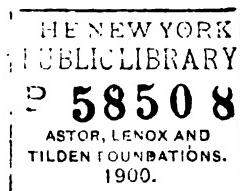
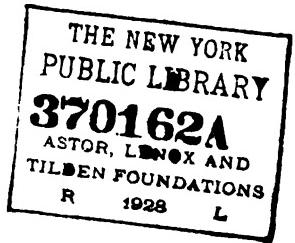


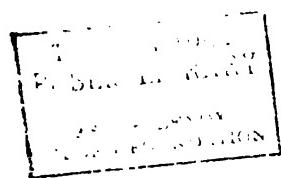
CENTRAL STATION SITE—THE START.



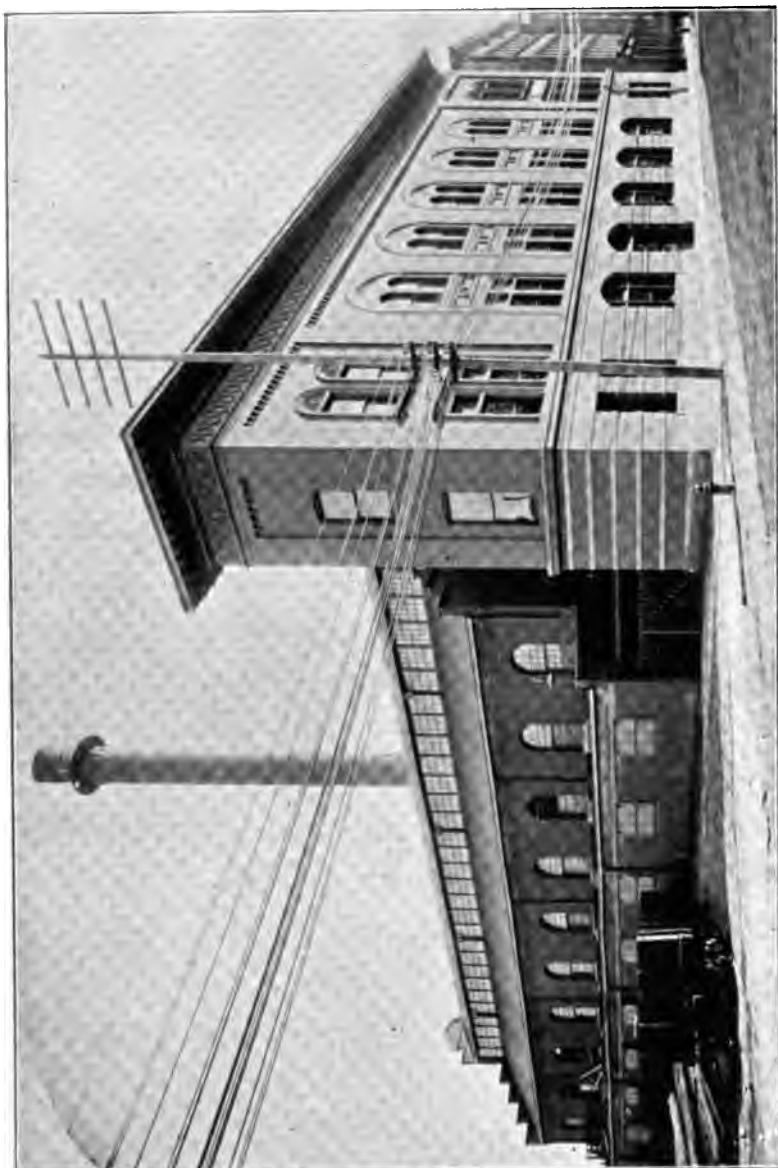
FIRST
ANNUAL REPORT
OF THE
Public Lighting Commission
OR
THE CITY OF DETROIT
FOR THE
Fiscal Year, Ending June 30th, 1896.
TOGETHER WITH A BRIEF
HISTORY OF ELECTRIC LIGHTING IN DETROIT,
SINCE 1883.

THE THOS. SMITH. PRESS,
DETROIT, 1896.





OFFICE AND STATION BUILDINGS.



PUBLIC LIGHTING COMMISSION.

MEMBERS :

WM. R. FARRAND,	1897	J. L. HUDSON,	1898
WM. A. JACKSON,	1899	CHAS. H. RITTER,	1900
R. H. FYFE,	1901	EDWIN HENDERSON,	1902

COMMITTEES :

Finance—Commissioners RITTER and FYFE.

Extensions—Commissioners HENDERSON and RITTER.

Lines and Lamps—Commissioners HUDSON and JACKSON.

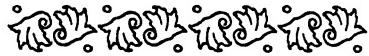
Central Station—Commissioners FYFE and HUDSON.

Fuel and Supplies—Commissioners JACKSON and HENDERSON

OFFICERS :

President,	WM. R. FARRAND.
Secretary and General Manager,	WILL F. CONANT.
City Electrician,	WALTER D. STEELE.
Master Mechanic,	JOHN DONALDSON.
Supt. of Lamps and Cables,	JAS. B. McCARTHY.
Supt. of Towers,	PHIL. G. FASSNACHT.
Supt. of Conduits,	EDWIN C. GEVES.
Supt. of Lines,	ROBT. S. STEWART.
Head Trimmer,	THOS. SHUTTLEWORTH.
Chief Lineman,	JOHN C. HOETGER.
Storekeeper,	HARRY A. KRONBERG.





To the Honorable the Common Council:

Gentlemen—The Public Lighting Commission herewith presents, for your consideration, the First Annual Report of the operation and maintenance of the Public Lighting Plant, together with a brief history of electric lighting in Detroit, a description of the power station and the distribution systems, as well as a statement of construction costs to July 1st, 1896.

Very respectfully,

WM. R. FARRAND,
J. L. HUDSON,
W. A. JACKSON,
CHAS. H. RITTER,
R. H. FYFE,
EDWIN HENDERSON,
Commissioners.





POST LIGHT.

HISTORICAL.

CONTRACT LIGHTING.

Detroit was one of the very first cities of the country to adopt the arc lamp for street illumination, and for the past thirteen years the service has been gradually extended, until not only the business portion of the town but the out lying districts as well, are provided with such lights. Prior to the introduction of the electric light the city was lighted by gas in the down town section and by naptha lamps in the outskirts. In 1882 a franchise was granted to the Brush Electric Light Company to construct lines in the public streets and in June of that year this company proposed to light the central portion of the city at a uniform rate of fifty cents per light per night according to moonlight schedule. The Common Council, however, declined to abandon the system of gas and naphtha lamp lighting then in use. This was due partially to the opposition of the gas companies and partly to the fact that the lamps were lighted and extinguished by a large force of lamp lighters employed by the city under the supervision of a city Gas Inspector.

The following year the Brush Company renewed its proposition and when the proposals for street lighting were reported to the Common Council by the Committee on Gas Lights, recom-

mending that the contract be again awarded to the gas companies for the entire lighting, Ald. Jas. W. Fules, one of the Committee, presented a minority report in which he said:

"The undersigned believes the fact should be recognized that private enterprise has in many instances caused the substitution of electric lights for gas with good results, and he believes the city should not be behind private interests in securing better light if possible. The main avenues should at least be lighted with electric lights, and he therefore recommends that Woodward and Jefferson avenues be lighted in accordance with the proposal of the Brush Electric Light Company."

This report, together with a resolution in conformity with it, was lost by a vote of 17 to 7, and the recommendation of the majority of the Committee, favoring gas and naphtha, adopted 19 to 5.

At that time the legislative department of the city government was composed of two bodies, the Board of Aldermen and the City Council, and when the resolution authorizing a contract with the gas companies came before the latter body the Councilmen amended it so as to provide for lighting Woodward avenue from Adams avenue to the river and Jefferson avenue from Third street to Brush street with electric lights. When the amended resolution came back to the Board of Aldermen it was vigorously supported by the more progressive members, with the result that it was concurred in by a vote of 15 to 7, and commencing August 1, 1883, the territory above described was lighted by 22 electric lights, increased during the year to 24 lights, displacing 116 gas lamps.

This small beginning gave such general satisfaction that when the annual contract for lighting came to be let in 1884 the Board of Aldermen unanimously awarded the contract for lighting the entire city to the Brush Company, agreeing to pay

therefor the sum of \$95,000. By the terms of this contract the company agreed, "to erect seventy-two towers, six not less than 150 feet in height, and sixty-six not less than 104 feet in height, employing 300 arc lamps of 2,000 candle power each, including ten lights to be distributed at certain points in the City Hall and Central Market Building." The award of this contract was concurred in by the City Council and thus began the general use of electric lights in the streets and public buildings of Detroit. The Brush Company continued to light the city until 1890, when they were underbid by the Detroit Electric Light & Power Company, who continued to supply the lighting until the Public Lighting plant was put in operation.

The following table shows the increase in the number of lights in operation each year, together with the amount paid therefor and the cost per light per year.

Contractor.	Year ending June 30.	No. of Lamps.	Amount Paid.	Cost per Lamp.
Brush Electric Light Co.....	1884	24	\$ 3,649 53	\$152 07
Brush Electric Light Co.....	1885	300	71,982 00	239 94
Brush Electric Light Co.....	1886	382	91,570 97	239 71
Brush Electric Light Co.....	1887	565	115,490 26	204 41
Brush Electric Light Co.....	1888	606	117,370 18	193 04
Brush Electric Light Co.....	1889	702	128,062 78	182 42
Brush Electric Light Co.....	1890	719	137,937 30	191 84
Detroit Electric Light & Power Co..	1891	1,031	133,716 55	129 69
Detroit Electric Light & Power Co..	1892	1,168	152,282 70	130 38
Detroit Electric Light & Power Co..	1893	1,279	164,830 91	128 87
Detroit Electric Light & Power Co..	1894	1,279	169,360 35	132 41
Detroit Electric Light & Power Co..	1895	*	153,004 36	.....
Detroit Electric Light & Power Co..	1896	†	28,796 41	.....
			\$1,468,054 30	

*A portion of city lighted last three months by Public Lighting Plant.

†Entire city lighted by Public Lighting Plant last nine months.

The three years' contract with the Detroit Electric Light & Power Company expired June 30, 1893, and, acting under authority of a resolution passed by the Common Council June 6, 1893, the Public Lighting Commission arranged with the com-

pany to continue the lighting from month to month at the former rates. These rates were as follows:

No. of Lamps.	Rate.	Price.
877	Contract.	\$115,825 45
440	35c per night	56,210 00
12	48c per night	2,102 40
1,279		\$174,137 85

When the city began taking over the street lighting in April, 1895, a uniform rate of \$11.15 per lamp per month was agreed upon as a basis of payment for lights still furnished by the contractor, which agreement remained in force until October 1, 1895, when the Public Lighting Plant was put in full operation.

MUNICIPAL OWNERSHIP.

In his first message to the Common Council, January 14, 1890, the Mayor, Hon. H. S. Pingree, began the agitation for a municipal lighting plant. He said, among other things, "Lighting the streets is as much a public matter as street paving and cleaning, sewer building, maintaining and improving the parks and boulevards, supplying water or providing protection against fire. I think the time has come when the city should assume control of public lighting and own and operate its own plant for that purpose, thereby escaping the caprices or combinations of private corporations."

In his next message, delivered January, 16, 1891, Mayor Pingree again called attention to this subject, saying: "The



STATION BUILDING—FROM RIVER.

7

present city lighting contract has something over two years yet to run. But it is not too early to inaugurate measures looking to the ultimate ownership by the city of an electric lighting plant."

The Mayor's message delivered January 12, 1892, contained an abstract of reports from 88 cities in the United States showing the cost of lighting in those cities, from which it appeared that the price paid in Detroit was greatly in excess of the average paid elsewhere. The contractors were also criticized for the poor character of the service rendered. This portion of the message was commented upon by the press of the city and attention was repeatedly called to the large number of lights out each night. Indeed complaints on this head were heard almost every day from citizens whose business required them to be in the streets at night.

January 10, 1893, Mayor Pingree again urged the building of a municipal lighting plant, stating that in reports from 92 cities owning their plants the cost was only about half what it was where the lighting was done by contract. He also said that a majority of the Detroit delegation to the state legislature was pledged to the speedy passage of an act enabling the city to do its own lighting.

A bill having this end in view was prepared and introduced in the state legislature, and after a prolonged hearing before committees of the Senate and House, in which the Mayor took an active part, the bill was passed and received the Governor's signature March 18, 1893. The full text of the act will be found in the appendix to this report.

Meanwhile, acting under instructions from the Common Council, the Controller had advertised, under date of February 7, 1893, for proposals for lighting the city by contract. In response to this advertisement but one bid was received, that

of the Detroit Electric Light & Power Company. Their bid was as follows:

Term.	Pole Light.	Arm Light.	Tower Light.	Total Yearly.
1 year	\$0.41	\$0.42	\$0.45	\$155.73
2 years	.39	.40	.43	148.43
3 years	.32	.33	.37	124.10
5 years	.31	.32	.36	120.45
7 years	.28	.29	.33	109.50
10 years	.26	.27	.31	102.20

The city, under the charter, had no authority at this time to contract for lighting for a longer period than three years, and, on the recommendation of the Controller, the proposal was rejected by the Common Council, March 14.

In accordance with the provisions of the Act the question as to whether the city should establish a public lighting plant was submitted to a vote of the electors at the election held April 3, 1893, the vote resulting as follows: Yes, 15,282; No, 1,245.

April 25, 1893, the Common Council passed a resolution determining it advisable to establish a plant for public lighting to be owned by the City, and May 24 the Public Lighting Commission was directed to make the necessary purchase of lands, machinery, wires, etc., to carry out the objects of the lighting act.

On May 9, 1893, the Common Council authorized the issue of bonds to the amount of \$600,000.00, to defray the cost of erecting a public lighting plant, and on May 19 the Board of Estimates consented to the issue. Proposals for the purchase of these bonds were opened by the Controller June 13, but as none of the tenders were for the par value of the bonds, as the City Charter directs, they were not sold. Nothing further was done in the matter until December 22, when new bids were received, and the bonds were ordered sold on the following day at a

premium of \$27,540.00 for the entire issue. On February 27, 1894, the Controller reported the delivery of the bonds to the successful bidder and the deposit of the proceeds to the credit of the Public Lighting Fund.

THE COMMISSION.

At a session of the Common Council held March 28, 1893, Mayor Pingree appointed the following members of the Public Lighting Commission, and they were confirmed by the Council April 4, the day succeeding the election at which the building of a public lighting plant was authorized:

Martin Butzel, for term of one year.
C. A. Newcomb, for term of two years.
Geo. H. Lothrop, for term of three years.
Wm. R. Farrand, for term of four years.
J. L. Hudson, for term of five years.
W. A. Jackson, for term of six years.

Mr. Newcomb resigned in July following, on account of ill-health, and was succeeded by Mr. R. H. Fyfe, who was reappointed April 16, 1895, for the full term of six years.

On March 26, 1895, Mr. Chas. H. Ritter was appointed to succeed Mr. Martin Butzel, whose term expired April 4, 1895, and on April 28, 1896, Mr. Edwin Henderson was appointed to succeed Mr. George H. Lothrop, whose term expired April 4, 1896.

The original commission held its first meeting at the Mayor's office in the City Hall on the evening of April 15, 1893, and organized by electing Commissioner Jackson president and Commissioner Lothrop secretary pro tem. Mr. Jackson con-

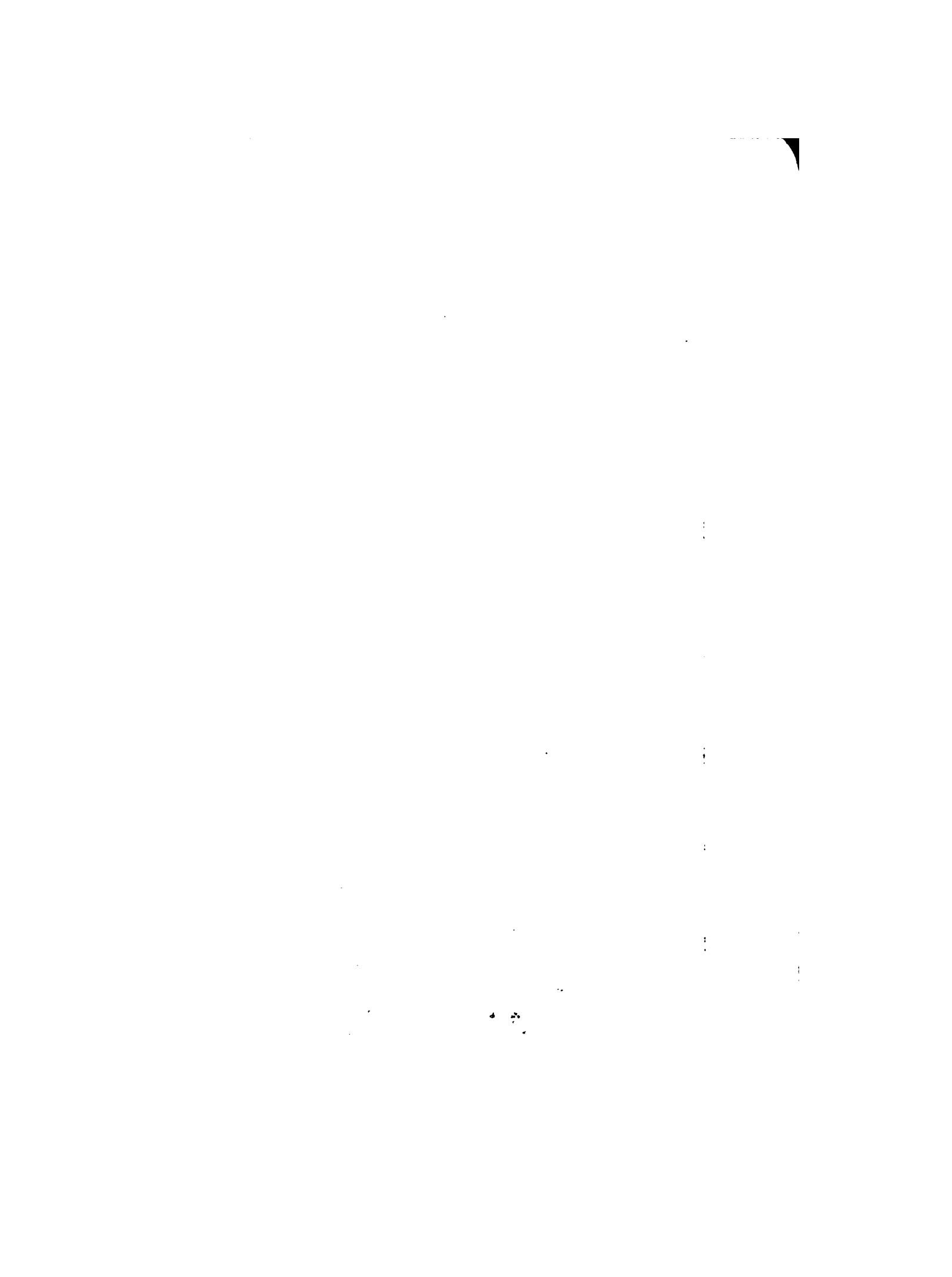
tinued to act as president until the annual meeting held July 12, 1894, when he was succeeded by Commissioner R. H. Fyfe. June 9, 1896, Commissioner W. R. Farrand was elected president for the fiscal year beginning July 1.

At a meeting of the commission held in the president's office April 29, 1893, Will F. Conant was appointed secretary, and a few days later an office was established at No. 511 Hammond building, where the business of the commission was transacted until December 1, 1894, when the present office building was occupied.

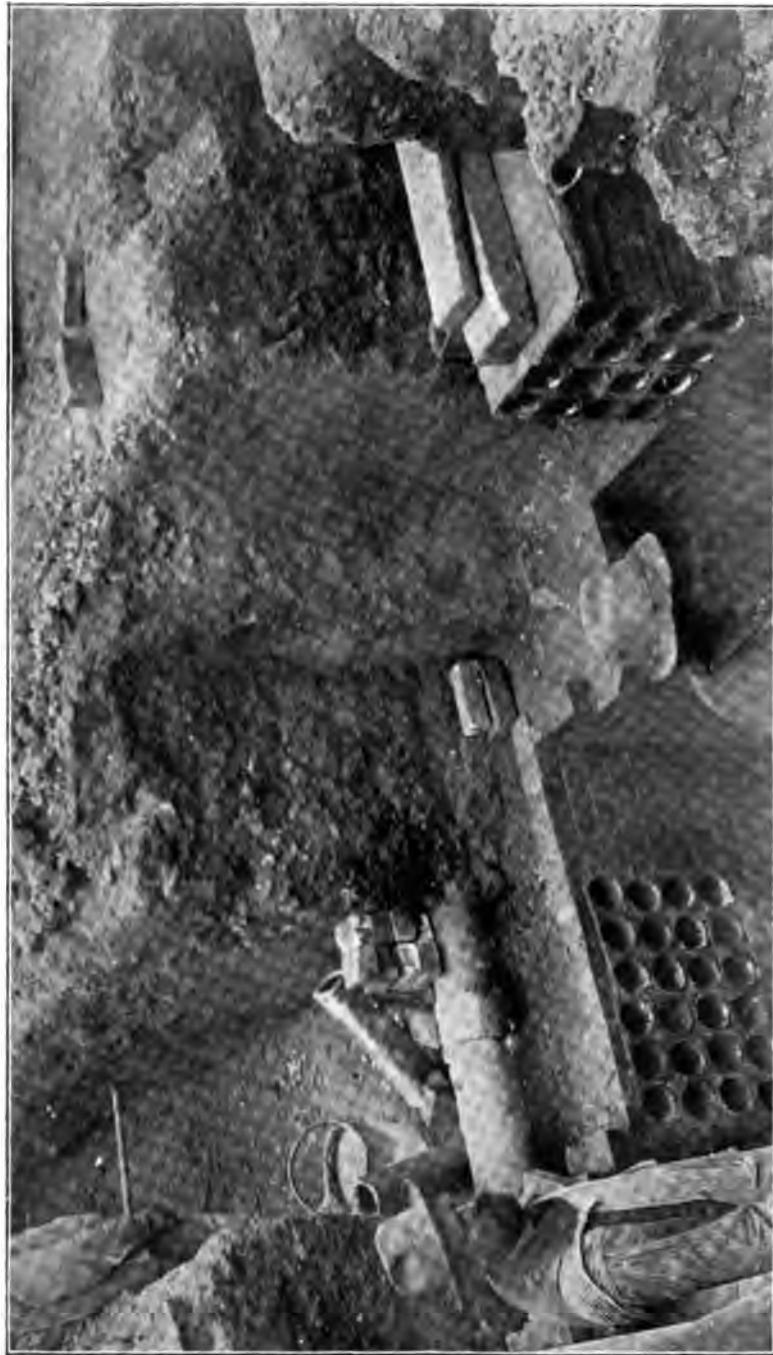
The Public Lighting Act having provided for the appointment of an electrical engineer, to be known as the City Electrician, the commission appointed Alex. Dow to that position June 14, 1893, and June 3, 1895, appointed Walter D. Steele Assistant City Electrician. At the same meeting Dr. Royal T. Farrand was appointed surgeon of the department.

In July, 1893, the City Electrician was authorized to employ Mr. Jesse M. Smith, of Detroit, and Prof. H. S. Carhart, of Ann Arbor, as consulting engineers in preparing plans and laying out the work of the commission.

Mr. Dow continued to serve as City Electrician until July 1, 1896, having declined a reappointment at a meeting held June 6. At the same meeting Mr. Walter D. Steele was appointed to succeed Mr. Dow, and Will F. Conant was appointed secretary and general manager.



MANHOLE CONSTRUCTION—CONDUIT.



CONSTRUCTION.

CENTRAL STATION.

Early in June, 1893, the Commission advertised for proposals to furnish land situated on the river front, suitable for the location of a power house, and received a large number of responses, embracing sites as far west as Swain avenue and as far east as the Water Works. After personal inspection of the several properties offered, and a survey of the most central ones by engineers employed for that purpose, the Commission unanimously decided to purchase the property offered by Hiram Walker, and owned by himself, D. M. Cooper and A. E. Viger. This parcel embraces eleven lots on the south side of Atwater street between Bates and Randolph streets, and contains 64,175 square feet, the purchase price being \$63,125.00. This site has a frontage of 218 feet on Atwater street, this width being maintained for an average distance of fifty feet towards the river. The main section of land from this point to the river is 161 feet in width and has an average depth from Atwater street to the harbor line of 365 feet. The dock on the river front has been entirely re-built 12 feet farther into the river,

sheet piling being placed at the old dock line, and the space thus made filled with earth. This affords a substantially built public dock connected with Atwater street by a driveway 12 feet wide, and but one block from the foot of Woodward avenue.

General outline plans of the buildings necessary to be erected were prepared by the City Electrician, Mr. Alex Dow, and the Consulting Engineer, Mr. Jesse M. Smith, and upon their approval by the Commission were placed in the hands of Messrs. John Scott & Company, who worked out the detailed plans and specifications. In general terms these plans provided for a brick office building three stories high, having a frontage of 136 feet on Atwater street with a width of 35 feet at the west end and of 14 feet at the east end. The front of this building was made tapering in shape to conform to the street line. The first floor of the office building is divided into convenient rooms for machine and blacksmith shop, storeroom, trimmers' room, carpenter shop and supply storeroom. The second story is devoted to the offices of the Commission and Secretary, the Electrical Engineer, draughting room and lamp repair room. The third floor is divided into two large rooms for storage of globes, patterns and bulky supplies.

In the rear of this building and separated from it by an alley 16 feet wide, is the Power House, the foundations for which were made by excavating to the river level and driving 1,893 elm piles 23 feet long. These piles were capped with oak timbers and the timbers cross planked with oak. The power house contains an engine and dynamo building 50x150 feet in size and a boiler house 48x150, the two being joined together by a smaller building 17 $\frac{1}{2}$ x150. The floors of the boiler room and basement of engine room are of artificial stone and the floor of the engine room proper is of four inch Norway pine

plank eight feet above the basement, the plank covered with 1½-inch matched hard maple. The small building between the engine and boiler houses contains the office of the station where the engineer on watch has his headquarters. Adjoining is a wash room with lockers for the men's clothing; shower bath and closets for the engineers. Next to this is a similar wash room for the firemen, oilers and other men about the plant. Then comes the stack room out of which rises the smoke stack, built of steel plates and bricked inside, having an average diameter of nine feet and being 150 feet in height with a fifteen foot foundation, making the top of the stack 165 feet above the level of the river. This room also contains the heater and hot well. Next comes the pump room containing the condensers, fire pump and engine and dynamo for the incandescent lighting necessary in the day time. The last room next the office building is fire proof and contains tanks for the lubricating oils, kerosene oil, paints and other inflammable material. Adjoining the boiler house are the coal bins, ten in number, capable of holding 800 tons of lump coal. A railway track alongside the bins connects with the Lake Shore and Grand Trunk tracks at Rivard street. The roofs of the plant are the ordinary steel truss covered with slate, while those of the office and pump room buildings are of copper. All the buildings are heated by steam and a complete iron pipe sewer system surrounds and runs through them, discharging into the river at the lower side of the property. Water for the condensers and for fire protection is obtained by means of a 16-inch intake pipe opening into a crib built in the dock, the mouth of the pipe being eight feet below the normal level of the river. A similar pipe for discharging the overflow from the hot well opens into the crib two feet above the intake pipe. The cost of constructing these buildings was as follows, contracts being let to the lowest bidder:

Excavation	\$ 3,934 00
Piling and timbering.....	9,396 95
Mason work	23,876 00
Painting and Glazing	2,100 00
Carpenter work	7,466 17
Cut stone	3,470 00
Plumbing	2,496 23
Roofing and metal work.....	5,034 46
Iron work	6,474 44
Smokestack	2,413 00
	————— \$66,661 25
Architects	\$ 3,453 80
Inspection, B. P. W.....	1,483 00
Boiler room floor	649 73
	————— 5,586 53
Total	————— \$72,247 78

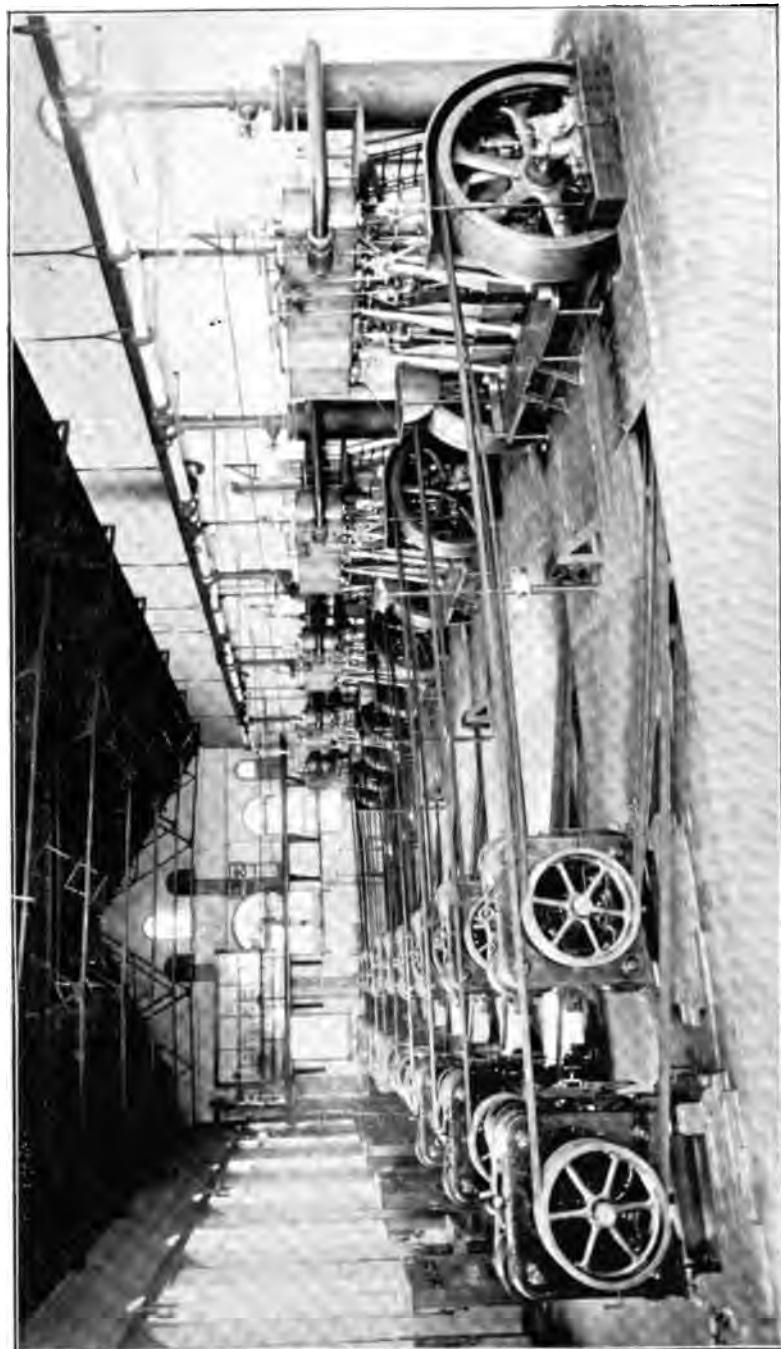
The space between the buildings and the dock has been sodded and brick paved driveways constructed, the whole forming an attractive green spot on the river front.

UNDERGROUND WORK.

One of the first subjects considered by the Commission was the construction of an underground system of distribution in the territory within a circle of one-half mile radius from the City Hall. It was decided after a thorough investigation, to construct a composite system consisting of vitrified clay tile laid in concrete for the main lines and of 2½-inch wrought iron pipe dipped in graphite paint for the lateral lines. Surveys were made of the streets proposed to be opened, care being taken to avoid those streets in which concrete foundations for pavements had been laid. Test holes were dug in the streets selected to ascertain the exact location of similar constructions already in these streets.



ENGINE AND DYNAMO ROOM.



A heavy line of sixteen ducts was constructed in Woodbridge street from Wayne street to Beaubien street and the center of distribution, at Bates and Woodbridge streets, was connected with the station by twenty-four ducts down Bates street. Three branches running northward from the plant are, one on the west side up Wayne street and Washington avenue, the middle one up Bates, Farmer and John R. streets, and the east line up Beaubien street. The line up Bates street was connected with the Wayne street line by building through Cadillac square to the Soldiers' Monument, from which point a tunnel was built to the westerly line of Woodward avenue from whence a line of nine duct conduit extends up Michigan avenue to Third street.

From September 2, to December 1, 1893, the west side was constructed to Woodbridge and Wayne streets and the east line to Woodbridge and Randolph streets. Work started again at the corner of Woodbridge and Wayne streets April 1, 1894, and was completed June 16. Besides the Woodward avenue tunnel two tunnels, each 90 feet long, were dug under Jefferson avenue at Beaubien street and at Bates street and the tile laid about eight feet below the surface, the tunnels being filled with concrete around the ducts. These tunnels avoided the tearing up of asphalt pavements and the hinderance of traffic.

The following is a list of streets in which main line conduit is laid, together with the number of ducts in each street:

In Woodbridge street from Bates street to Wayne street.....	16 ducts
In Wayne street from Woodbridge street to Michigan avenue.....	9 ducts
In Washington avenue from Michigan avenue to State street.....	9 ducts
In Washington avenue from State street to Park street.....	6 ducts
In Michigan avenue from west line of Woodward avenue to Third st.	9 ducts
In Michigan avenue from Wayne street to Second street.....	4 ducts
In Bates street from Atwater street to Woodbridge street.....	24 ducts
In Bates street from Woodbridge street to Farmer street.....	9 ducts
In Farmer street from Bates street to John R. street.....	9 ducts

In John R. street from Farmer street to Elizabeth street..... 9 ducts
 In Cadillac square from Bates street to east line of Woodard ave... 9 ducts
 In Atwater street from Bates street to Randolph street..... 16 ducts
 In Randolph street from Atwater street to Woodbridge street..... 16 ducts
 In Woodbridge street from Randolph street to Beaubien street..... 16 ducts
 In Beaubien street from Woodbridge street to Clinton street..... 9 ducts
 In Clinton street from Beaubien street to Municipal Court building... 9 ducts
 Across Michigan avenue from Wayne street to Washington avenue.. 10 ducts

The lateral lines of iron pipe are laid usually in the lawns and sidewalk space inside the curb line of the street and serve to connect the cables in the main lines with the lamp posts and towers. The following table shows the total amount of tile laid in the main lines of conduit with the several sizes reduced to single duct:

Size of line.	Length of line.	Feet single duct.
4 duct.....	1,158 ft. 8 in.	4,634 ft. 8 in.
6 duct.....	882 ft. 2 in.	4,993 ft. 0 in.
9 duct.....	13,383 ft. 10 in.	120,454 ft. 6 in.
10 duct.....	15 ft. 4 in.	153 ft. 4 in.
12 duct.....	96 ft. 0 in.	1,140 ft. 0 in.
15 duct.....	560 ft. 10 in.	8,412 ft. 6 in.
16 duct.....	2,104 ft. 8 in.	33,674 ft. 8 in.
24 duct.....	347 ft. 2 in.	8,332 ft. 0 in.
<hr/>		
Total single duct.....		181,794 ft. 8 in.

The total cost of this conduit ready for rodding and pulling in of cables was as follows:

Tile purchased.....	\$ 7,509 92
Contract for laying.....	23,927 41
Manhole covers.....	1,232 63
Moving gas and water pipes.....	13 14
Cement.....	3,678 21
Relying pavements.....	3,538 35
Damage to buggy.....	25 00
Teaming.....	395 85
Brick.....	219 90
Crushed stone.....	347 48
Labor.....	1,559 34

Sand and sewer crock.....	168 12
Iron for manholes.....	204 37
Sodding Washington avenue.....	43 10
Advertising for proposals.....	84 76
Inspection, Board of Public Works.....	375 00

	\$43,382 58

The cost per foot of single duct complete, including 88 manholes connected with public sewers was 23½ cents.

Provision has been made in the main lines for an increase in the number of circuits for many years to come as well as for the use of private companies in order to clear the down-town section of overhead wires, such companies to pay a proper rental therefor. The contractors for laying the iron pipe laterals began work May 7, 1894, and finished June 20, a total of 39 working days, during which time they laid 33,258 feet of pipe and constructed 149 handholes, of which five are connected with the public sewers. The total cost of the lateral work was as follows:

Iron pipe.....	\$ 4,381 38
Cement.....	318 44
Repaving and inspection, B. P. W.....	1,927 88
Trenching and pipe laying.....	3,297 45
Handhole covers.....	1,247 30
Advertising for bids.....	15 73
Caps and couplings.....	9 90
Cartage.....	7 65
Bell mouth castings.....	121 33
Graphite paint.....	8 75

Cost per foot, including 149 handholes	34½ cents
	\$11,570 81

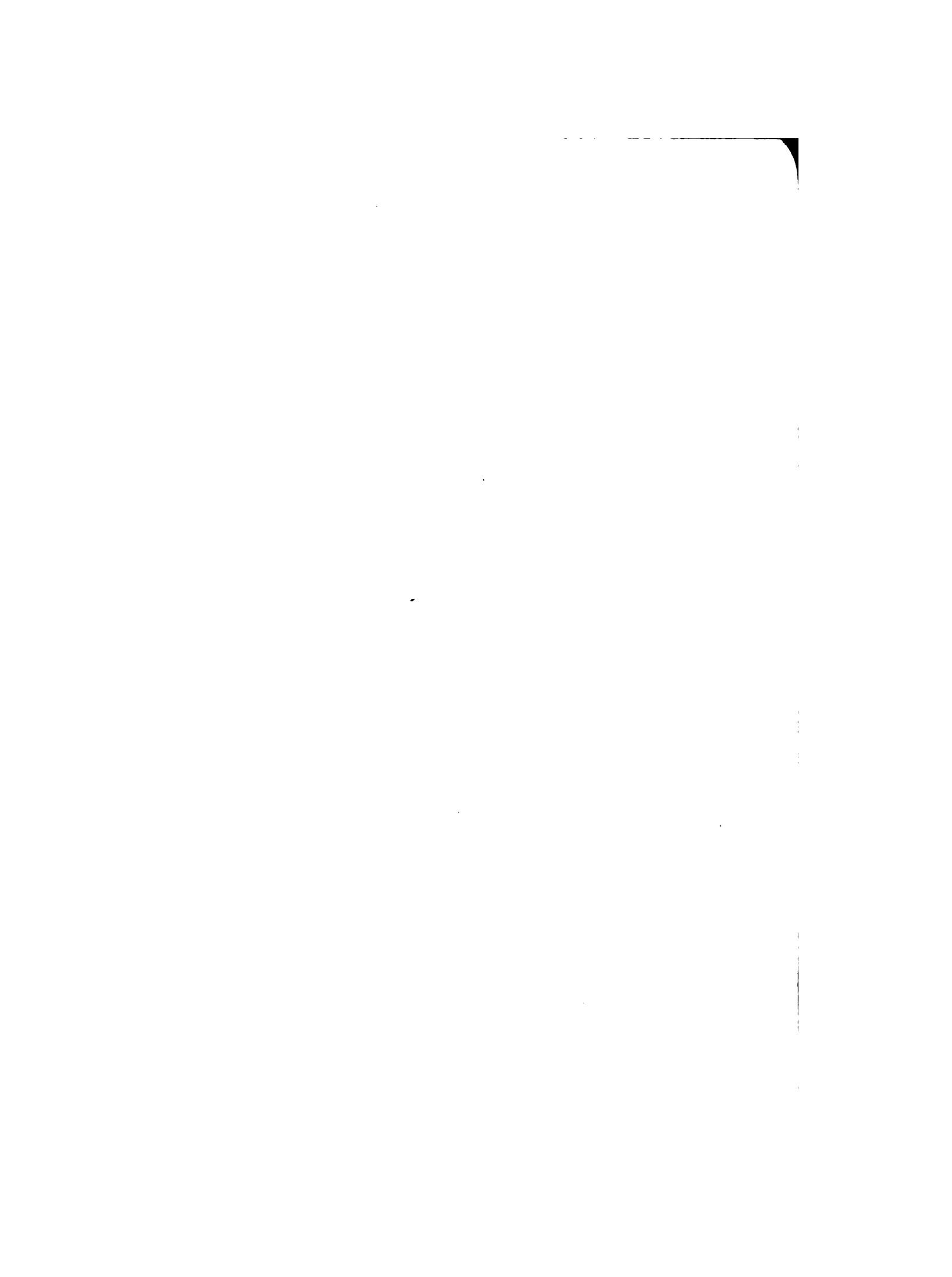
The total mileage of conduit is as follows: Main line, 34.43 miles; lateral lines, 6.30 miles; total, 40.73 miles. Of this amount 12.70 miles is occupied by the public lighting cables, the remaining 28.03 miles being available for extensions and rental.

STEAM PLANT.

After a careful inquiry into the latest developments of steam engineering, both marine and stationary, it was decided that the best results in the way of economy and reliability would be obtained by the use of steam at 160 pounds pressure in triple expansion, condensing engines. The location of the plant on the river furnished an ample supply of water for condensation, free of charge. The nature of the work required of the steam machinery was similar to that required of marine engines, in that it consisted of operation at a practically constant load from beginning to end of the run and that the engines were never likely to be operated at less than their most efficient output. The marine type of triple expansion engines has been developed on the lines of simplicity of construction, facility of repair, and economy of fuel, and the marine engine builders of Detroit have had no small share in the work of development.

The steam plant installed has seven double deck, tubular boilers, designed by Mr. C. C. Peck and furnished to the Commission by Chas. A. Strelinger & Company, of Detroit. Each boiler has a heating surface of 3,000 square feet. The feed water enters through a Hoppe Purifier, attached directly to each boiler. The furnaces are of the Hawley Down-draft type, they having been selected with a view to secure economical and smokeless consumption of soft coal. The results in both directions are satisfactory. The smokestack of the Lighting Plant is notable among the others in town as seldom showing any signs of smoke, and never giving the black discharge which usually accompanies the use of soft coal.

The engines are five in number, each having three cylinders 11 $\frac{1}{2}$, 18 and 29 inches in diameter respectively, with a stroke of



ENGINE AND DYNAMO FOUNDATIONS.



18 inches, and running at 200 revolutions per minute. The initial steam pressure is 160 pounds and the best economy is obtained when indicating not less than 250 nor more than 340 horse power. There are two flywheels to each engine, each wheel weighing 7,500 pounds. The engines were built and furnished to the Commission by S. F. Hodge & Company, of the Riverside Iron Works, Detroit. The combined condensers and feed pumps are of the Worthington make, two in number, either of the two being able to condense the exhaust steam for 2,000 indicated horse power and to furnish feed water to the boilers for the same power. There is also a fire pump of the Worthington make. The exhaust steam from the cylinders of the pumps is not condensed but is used during the winter months for the heating of the buildings and during the summer months to increase the temperature of the boiler feed water.

The system of piping of the plant includes steam mains, condensing exhaust mains, non-condensing exhaust mains, feed water piping and a system of fire protection. The latter is connected to the fire pump already mentioned and has, besides the necessary openings in the buildings, three hydrants outside, two being on Atwater street and one in the lawn between the power house and the river. These hydrants are connected to a system of 6-inch and 8-inch piping on the same plan as that adopted by the Fire Commission for the fire-boat service and the hydrants are available for use by the Fire Department exactly as are the fire-boat hydrants.

The main system of steam piping was constructed by the Commission's own employees, the flanges being machined and the pipes cut in the Commission's shop. Exceptional care was taken throughout to secure ample strength. The flanges and tee connections are of car wheel metal, extra heavy, with tongue and grooved joints and the pipes are bent to shape

wherever an angle is necessary so as to avoid the use of cast iron elbows. The condensing exhaust main is of copper with cast iron flanges, which permits of a very light construction and at the same time is perfectly air tight. This part of the work was done by the Detroit Sheet Metal & Brass Works. A small but useful part of the equipment is a Westinghouse air compressor of the type used on locomotives for operating air brakes. This is connected to a system of piping extending throughout the building and furnishes compressed air for cleaning or blowing wherever required.

ELECTRIC PLANT.

This is in two sections, the first and much the larger one, being that designed for the lighting of the streets; the second being that required for the incandescence lighting of the public buildings within the half mile circle.

A very wide investigation was made by the Commission during the latter part of the year 1893, both by correspondence and by personal inquiry, into the state of development of apparatus adopted for the lighting of streets and public places. It was well known that the machinery then in general use for this purpose, although reliable, was far from being efficient, and it was reasonable to expect that improvements would be made in the near future. The Commission became convinced that the only improvement to be looked for at an early date was the development of the arc lighting dynamos of 60 or 70 lights capacity into larger sizes of greater efficiency; and believing that this progress would be assisted by a call for such

machinery in a plant of the size and character of the one to be installed in the city of Detroit, they prepared specifications for dynamos of 50 kilowatts output at 500 revolutions, and of 86% commercial efficiency. It is to be noted that the largest standard size at that time in this class of machinery was a dynamo of 32 kilowatts and that the efficiency was little over 70%. The result of these specifications was the receiving of bids from every leading manufacturer with the most complete guarantees of the operation and efficiency of the proposed machinery.

The Commission had incidentally investigated the possibility of the development of the alternating system of arc lighting. This offered many advantages, the most prominent being the great reduction of the number of dynamos necessary, of circuits and attendants. The disadvantages which were found were the unreliability of the alternating arc lamps and the losses in transmission and transformation of the alternating current, which more than offset the higher efficiency of generation. A bid on alternating machinery was received and very carefully considered, but rejected; and the developments in the last two years indicate that the rejection was wise.

A contract was entered into with the Western Electric Company for the supply of eighteen 50 K. W. constant current dynamos for series arc lighting. Another contract was entered into with the Brush Electric Co. for the supply of 1,500 series arc lamps. Certain improvements in the detail of the arc lamps were required in the specifications but the essential mechanism of the lamps was the same as the Brush Company's standard of the last four years. The dynamos and lamps, after operation by the city's employees for ninety days and after an exhaustive test by expert engineers, were found to conform to the specifications and have remained in continuous and satisfactory operation.

The arrangement of station connections for these dynamos, involving the handling of currents at a voltage of 5,000 to 5,500 volts, was given very careful study. There was not found in the market a satisfactory main switch board, although a unit switch board suitable for the operation of each group of dynamos was secured without difficulty. The Commission, therefore, directed the construction, in its own shops, of the main switch board which is a modification of the plug and cord style long in use, equipped with Weston standard instruments and with a bank of incandescent lamps for testing purposes. This board, after a year's service, has proved entirely satisfactory.

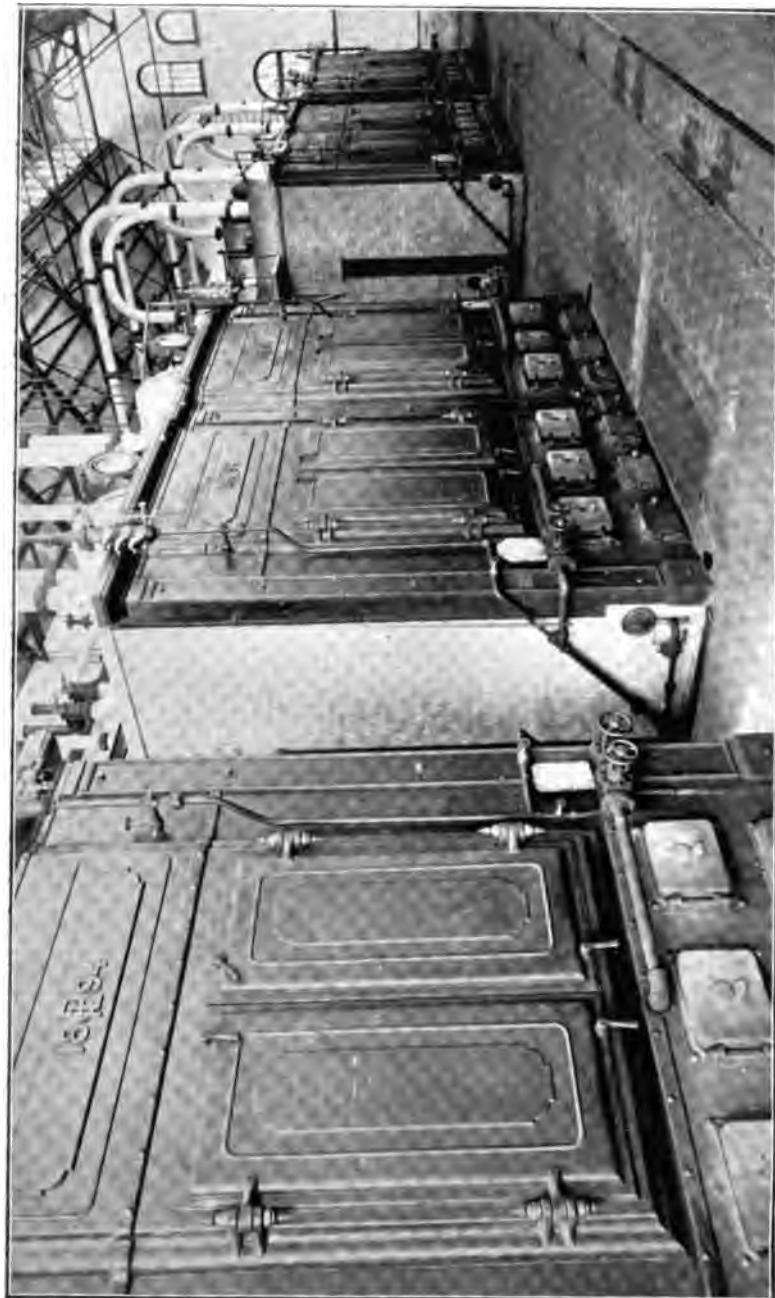
The original instructions of the Commission required it to furnish incandescence lighting to the City Hall and Municipal Court Building and, of course, to the Public Lighting Buildings. This service is required 24 hours a day and all three buildings are within the half mile circle, within which wires are ordered to be placed underground. If the cables were to be installed and machines run 24 hours a day it was desirable, for economy, that all the incandescence lighting of public buildings, which could be readily connected to the cables, should be done by the public plant. Representation to this effect to the different departments and Commissions of the city secured their concurrence, and machinery was installed and cables laid for the lighting of fourteen buildings as follows:

City Hall, Municipal Court Building, Health Department Building, Water Office, Police Headquarters, Police Telegraph Headquarters, Woodbridge Street Police Station, Fire Department Headquarters, Fire Alarm Telegraph Headquarters, Engine House No. 2, Chemical Engine House No. 4, Hook and Ladder House No. 2, Public Library and Public Lighting Station and Office Building, having a total of 2,503 lights wired.

The machinery for incandescence lighting was purchased from

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7
BOILER ROOM.



the Westinghouse Electric & Manufacturing Co. It consists of three 55 K. W. alternating current dynamos of the two-phase type, with transformers and station instruments. The primary voltage is 1,100; the secondary is 110 volts.

Two of these alternators are connected to the engines which run the arc lighting dynamos; the third alternator is connected to a non-condensing, compound Westinghouse engine which runs during the daylight hours, so that it is not usually necessary to operate a triple expansion engine or condensing machinery excepting during street lighting hours. The exception to this is during the two mid-winter months when the incandescence lighting load in the evening rises above the capacity of one alternator.

The eighteen arc dynamos and two alternators are connected to the five triple expansion engines in sets of four by rope driving gear. Each dynamo has seven endless cotton ropes of $\frac{3}{8}$ -inch diameter, and each of the two fly-wheels of the engine has fourteen grooves; so that the four sets of seven ropes are divided equally between the two wheels. It has not been found necessary to use any tension carriage with these ropes. The diameters of the pulleys are, on the engines 84 inches, and on the dynamos 34 inches.

DISTRIBUTION SYSTEM.

This is divided into two sections: The first is the underground district, in which there are connected 184 arc lamps and the 2,503 incandescent lights for building lighting already referred to. The cables (which are drawn into conduits, previously described) are rubber insulated with tape and lead

covering over the rubber. The arc circuit cables have a wall of rubber 7-32-inch thick around a No. 4 copper conductor. The feeder cables of the alternating system are identical with the arc cables. The mains have a 9-64-inch wall of rubber around a No. 8 copper conductor. These cables have been underground at the time of writing for eighteen months and in operation for fifteen months and are apparently as perfect as when first installed. They were furnished by the Safety Insulated Wire and Cable Co., of New York.

The second section is the overhead district, which supplies all the street lighting excepting that within the half mile circle. There are connected to these lines 1,309 arc lamps. The poles set by the Lighting Commission number 4,378 and vary in length from forty to seventy feet. They are of cedar up to a length of 55 feet; those of greater length, 220 in number, are of Norway pine. The location of the plant in the underground district involved a special study of the manner of connecting with the lines in the overhead district. It was considered undesirable to connect these lines into the general system of underground cables because of the serious risk of injury to the cables by lightning discharges. The best method appeared to be the construction of a tunnel of such dimensions as to permit the stringing of wires in the same general plan as is used on overhead work and the Commission looked favorably upon this plan, believing that the construction of such a tunnel or subway was certain to be required by the growth of the service. Under the existing conditions, however, the Commission did not see their way to incur the expense and it was decided to erect a special line of high poles through the streets nearest to the river, the poles being so located as to cause a minimum of obstruction to traffic and of such height as to cause a minimum of interference in the operations of the Fire Department in case

of fire. The line of 70-foot poles so planned and erected will serve (it is believed) all purposes until such time as the subway can be constructed. Since the erection of this main line the location of two new railway power houses on the river front just east of the underground district has involved the construction of a heavy line of feeders for the electric railway systems. These feeders, under an arrangement made by the Commission, have been placed on the main line of poles and an annual rental is collected for this use of the poles.

The City's wires on the overhead lines are of special weather-proof insulation, the wires on the main line being all hard drawn copper and on the subsidiary lines annealed copper. The total length is 329 miles. A single petticoat glass insulator of extra length is used throughout the system, and rubber insulated wire and hard rubber bushings are used wherever there is any special risk of leakage. These overhead lines, while subject to the ordinary accidents of operation of such constructions, have so far caused very few interruptions of service and those of a trifling character. A patrol system is maintained and points where trouble can be anticipated are carefully watched.

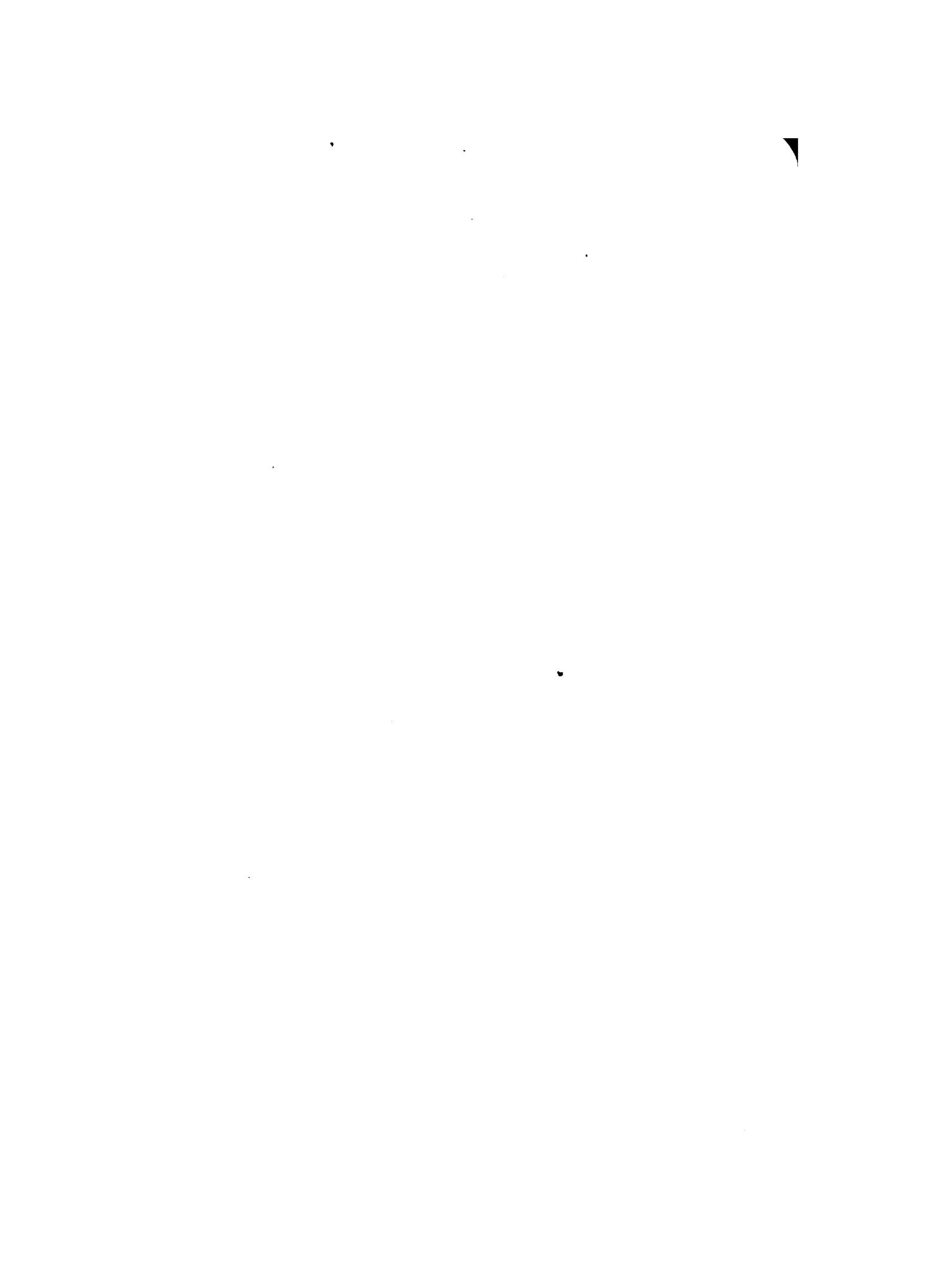
As between overhead construction and underground construction the experience of the Lighting Commission is that the underground construction is infinitely preferable. The only fault to be found with it is its first cost. Underground cables will certainly last longer than overhead circuits. The conduits are of imperishable material and under the conditions of the Detroit underground insulation interruptions of service are entirely unknown.

JOINT USE OF POLES.

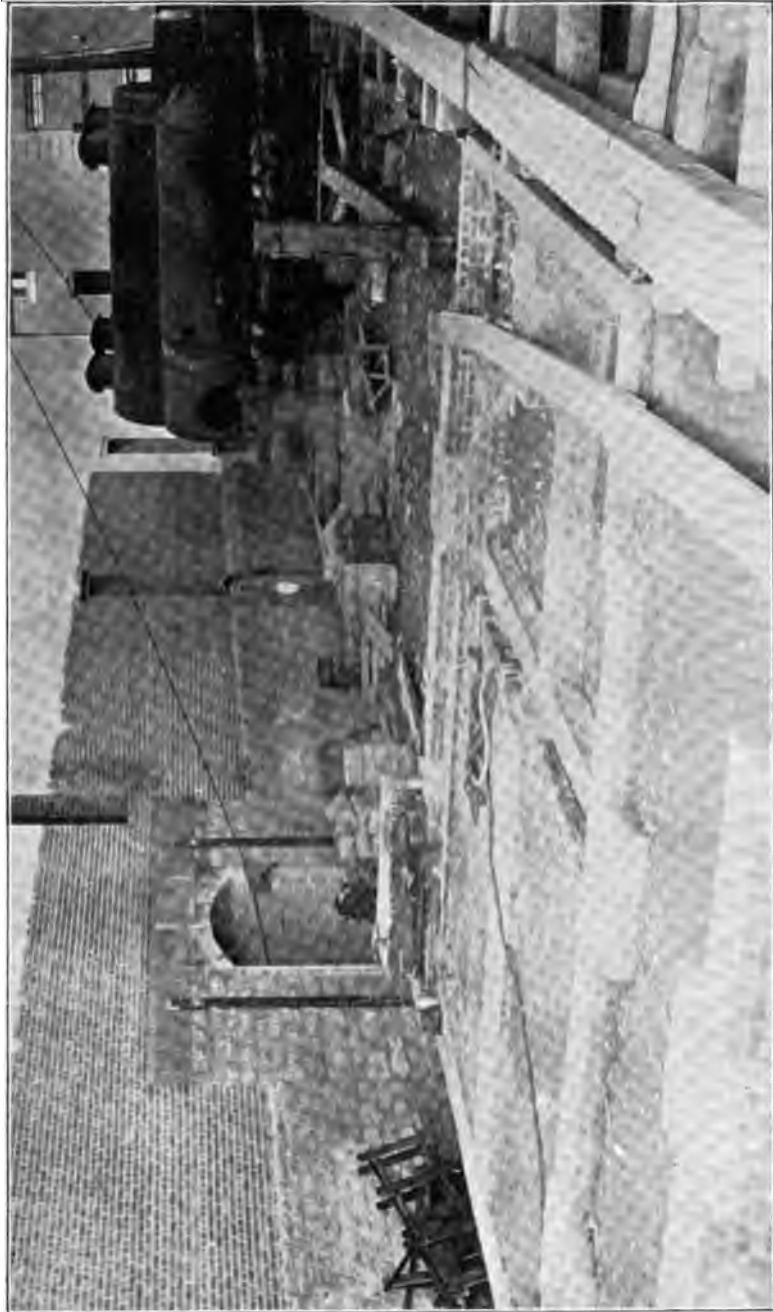
To minimize the obstruction of the streets by poles for carrying overhead wires, the Commission considered carefully the practicability of using the poles of the Fire Alarm Telegraph system and of the Police Patrol system; for both of which a great number of poles had already been set in the streets. After discussion with the Fire and Police Commissions, and after some experiments to show what interference might be expected between the circuits for lighting and those for telegraphs and telephones, a joint arrangement was made by the three Commissions under which each uses the poles of the other wherever convenient. At the end of 1895 there were 812 insulators on Fire Department poles occupied by public lighting wires; and 623 insulators on Police Department poles. And there were on public lighting poles, 417 insulators occupied by Fire Telegraph wires and 380 insulators occupied by Police Telephone wires.

An extension of this plan to the poles of the lighting, street railway, and telephone companies followed. With these companies no general agreement was made, but each case of joint occupation was considered on its merits. The stringing of street railway feeders on the main pole line has been elsewhere noted. This was followed by the use of public lighting poles as supports for span wires and by the placing of short loops of lighting circuits on extension pieces secured to the iron poles of the railway systems. Agreements were also made for the removal of old lines of the Peninsular Electric Light Company from certain crowded streets to the poles of the Commission.

It is a matter worthy of special notice that the relations of the Public Lighting Commission with the Michigan Telephone Company have been agreeable from the beginning; in view of



BOILER FOUNDATIONS.



the possibilities of interference between services so essentially different, and of the disputes which are so frequently reported from other cities. The Telephone Company has facilitated the construction of the public lighting lines from the beginning, by the clearing of routes desired by the Commission; and latterly by the joint use of poles. The use of telephone poles in certain districts for lighting wires has been the means of avoiding expensive and troublesome line work; and the use by telephone wires of lighting poles in other districts has avoided the duplication of poles on streets already afflicted with more than their share of such obstructions.

The experience of the Commission indicates that while lighting and telegraph or telephone wires are best kept on separate supports, yet under proper restrictions they may be strung on the same poles with safety and without injury to either service.

ENGINE AND DYNAMO TESTS.

While it was obvious from the first day of operation of the plant that the efficiency of the apparatus as a whole, from the furnaces to the dynamos, was fully up to the guarantees of the contractors and to the original calculations of the Commission's engineers, it was deemed advisable to make special and elaborate tests of the efficiencies of certain parts regarding which there had been most discussion; particularly the arc lighting dynamos. The making of this latter test was placed in the hands of Mr. Jesse M. Smith, of this city, and Professor Henry S. Carhart, of the University of Michigan, consulting engineers, who carried out an extensive program proposed by themselves

during the month of July, 1895. The results were entirely to the credit of the designers and builders of the dynamos; it being found that the efficiency (86%) and output contracted for were obtained at a speed a little less than the limit assigned; and that the reserve of power specified and ability to withstand the more common accidents of operation were amply provided.

Incidentally to the determination of the dynamo efficiencies it was ascertained that the power absorbed by the rope drives was very nearly three per cent of the output of the engines. This was shown by comparison between the power required to run pairs of dynamos direct coupled and the same pairs connected by the regular ropes.

A number of tests of the efficiency of the engines and boilers have been made at intervals during the past twelve months, on different engines and under different conditions, in each case with satisfactory results. The later tests show a small but steady increase in net output of the engines; due to greater smoothness of bearings and other frictional surfaces. The record kept constantly of fuel and water consumed per day, in comparison with the variation of the electrical output, is a continuous check on the efficiencies of all the machinery of the plant.

The permanent equipment of the plant includes a set of six Crosby steam engine indicators; and a standard voltmeter and amperemeter; by which instruments the running gauges and meters are checked from time to time.

CONSTRUCTION COSTS.

On the first day of July, 1896, the following amounts had been expended in the construction of the plant, \$32,675.00 having been raised by taxation in 1895 in addition to the amount realized from the sale of bonds:

Land for Central Station.....	\$ 63,125 00
Erection of buildings.....	66,661 25
Services of architects.....	3,453 80
Inspection, Board of Public Works.....	1,483 00
Dock building	3,746 60
Boiler room floor.....	649 73
Paving and sodding grounds.....	1,393 60
Sidewalks	220 69
Water intake system	2,608 21
Central Station fixtures.....	23,865 04
Pole line construction.....	107,779 81
Conduit construction and cables.....	87,802 53
Railway track	9,665 60
Towers	85,099 13
Engineering	16,585 25
Lamp posts	6,956 82
Steam plant	82,152 33
Arc lamps	29,628 62
Electric plant	40,842 53
Machine shop	5,378 19
Miscellaneous	2,349 54
	\$641,247 27
Less sale of material, rent of lines and labor for other boards, included above.....	11,106 55
 Net cost of plant to date.....	 \$630,141 72

OPERATION.

DISTRIBUTION OF LIGHTS.

The Commission began operating a portion of the plant April 1, 1895, lighting the 189 arc lamps connected with the underground system in the half-mile circle, and the incandescent lights in the City Hall, Municipal Court Building, Police Headquarters, Engine House No. 2, Fire Alarm Telegraph building, Water Board office and Public Lighting buildings. During the summer the Health Department building, Public Library, Police Telegraph office, Fire Department headquarters, and Woodbridge Street Police Station were connected, so that all buildings owned by the City within the underground district are now lighted from the City plant, except the Clifford street engine house.

Extensions of the service to the overhead system were pushed as rapidly as possible, street lights being taken on, so that the total number in operation each month was as follows: May, 294; June, 469; July, 708; August, 730; September, 814; and beginning October 1, the entire city was lighted with 1,470 lamps. Additions were made from time to time until 1,492 of the 1,500 lamps purchased were in operation, the remaining eight lamps being reserved to replace those brought in for repair each day.

CONDUIT CONSTRUCTION.



The hours for street lighting are every night from one half hour after sunset to one hour before sunrise, the time being somewhat extended on very cloudy or stormy evenings and on dark mornings. The police department reports all lights not burning, exactly as it did while the city was lighted by contract.

The following table shows the number of arc lights in operation July 1, 1896, as well as the number attached to each kind of fixture:

Kind of Fixture.	No. of Lamps.
1 light crane	724
1 light hanging	20
1 light pole top	15
2 light posts, 5.....	10
1 light posts	76
1 light mast arms	40
3 light towers, 45.....	135
4 light towers, 87.....	348
5 light towers, 1.....	5
6 light towers, 2.....	12
1 light center suspension	96
<hr/>	
Total	1,481

Illustrations showing the tower, post, crane and center suspension styles of lighting will be found in this report. Of the 135 towers employed 23 are within the half-mile circle, the larger part of the remainder being in the outer districts of the city where the buildings are small and scattered, and where the foliage is not dense in the summer. Eight of the towers are 100 feet high, two are 175 feet high, and the balance 150 feet. Of the styles of lighting not illustrated the pole top is a harp-shaped fixture attached to the top end of the line poles, and the

hanging lamps are those used in the Council Chamber and Power House.

In October last, at the request of the Board of Public Works, the Commission re-wired Belle Isle Bridge and equipped each of the fourteen sections of the structure with a series incandescent lamp to be operated from the arc circuits. An arc lamp was also placed at each end of the bridge and a post light in the center of the bridge approach. The circuit on the bridge proper is connected with the mainland by means of an armored submarine cable protected from ice above and below the water line by being encased in iron pipe.

OPERATING COSTS.

The following shows the total cost of operation and maintenance for the nine months from October 1, 1895, to June 30, 1896:

Coal, at \$2.19 per ton.....	\$12,208 09
Labor and management	55,821 63
Carbons	5,820 49
Oil and rags	1,149 76
Teaming	1,970 10
Globes and nets	476 40
General supplies	4,472 12
Printing and stationery	237 01
Freight and transportation	126 65
Incandescent lamps	327 70
Surgeon and hospital	194 00
Total	\$82,803 36

These expenditures were divided as follows:

Month.	Cost of Each Service.			No.			Cost of Arc Lamps.
	Incand't.	Arc.	Total.	Incand't.	Arc.	Lamps.	
October	\$ 559 86	\$2,524 40	\$9,084 26	2,339	1,470	5 79	
November	589 61	8,573 40	9,163 01	2,339	1,486	5 76	
December	663 91	8,986 91	9,650 82	2,457	1,492	6 02	
January	757 38	8,755 80	9,513 18	2,483	1,492	5 87	
February	725 51	8,261 74	8,987 25	2,483	1,477	5 59	
March	875 73	9,565 99	10,441 72	2,491	1,481	6 46	
April	786 26	8,066 90	8,853 16	2,503	1,482	5 45	
May	809 39	7,737 11	8,546 50	2,503	1,490	5 23	
June	838 70	7,724 76	8,563 46	2,506	1,481	5 22	
	<hr/>	<hr/>	<hr/>				
	\$6,606 35	\$76,197 01	\$82,803 36				

The above tables show an average of 1,483 arc lamps in operation during the nine months, for a total cost of \$76,197.01, which is \$5.71 per lamp per month, or \$68.52 per lamp per year. To this should be added \$16.18 per lamp for interest on bonds, making the total cost to the taxpayer \$84.70 per lamp per year. By reference to the historical portion of this report it will be seen that the city formerly paid the company having the lighting contract \$11.15 per lamp per month, or \$133.80 per lamp per year. The saving per year by the municipal plant is shown as follows:

1,483 contract lights at \$133.80.....	\$198,425 40
1,483 city lights at \$84.70.....	126,610 10
Net saving to the city	\$ 72,815 30

For purposes of comparison the following table is given showing the output for each service and the cost per kilowatt hour

each month, the expenditures being divided into but three classes, coal, labor and sundries:

Month.	Output, K. W. Hours.			Cost per k. W. Hour.			
	Incand't.	Arc.	Total.	Coal.	Labor.	S'dries.	
October	17,030	259,732	276,762	.00613	.02302	.00467	.03282
November	19,630	285,967	305,597	.00494	.02065	.00439	.02998
December	22,282	301,777	324,059	.00532	.01900	.00556	.02978
January	24,906	288,556	313,456	.00615	.01862	.00657	.03034
February	21,344	242,921	264,265	.00526	.02238	.00637	.03401
March	20,708	226,893	246,801	.00543	.02907	.00781	.04281
April	18,366	188,567	206,933	.00672	.02925	.00781	.04278
May	16,980	164,692	181,672	.00668	.03304	.00832	.04704
June	16,308	150,376	166,683	.00691	.03624	.00822	.05187

QUALITY OF SERVICE.

As noted above, reports are made each morning by the police department showing the number of lights out the preceding night, as well as the number of hours they were not burning. An accurate record of these reports is kept in the Commission's office, and from that record the following tables have been prepared:

CONTRACTOR OPERATING 1,279 LAMPS, 1893-4.

Month	No.		Per cent	
	Lamps out.	Hours out.	Lamps out.	Hours out.
October	1,319	6,825	3.226	1.500
November	1,372	11,988	3.575	2.455
December	2,710	20,485	6.835	3.887
January	787	4,304	1.985	0.834
February	2,898	17,642	8.092	4.131
March	1,177	5,317	2.943	1.270
April	1,729	8,930	4.506	2.551
May	1,273	4,833	3.211	1.543
June	1,679	6,102	4.375	2.186

CABLE TUNNEL INTO STATION.



CITY PLANT OPERATING 1,483 LAMPS, 1895-6.

Month	No. Lamps out.	Per cent		Per cent	
		Hours out.	Lamps out.	Hours out.	Lamps out.
October	152	1,040	0.335	0.201	
November	95	774	0.286	0.137	
December	138	940	0.300	0.154	
January	47	372	0.116	0.062	
February	42	301	0.098	0.059	
March	28	235	0.061	0.048	
April	31	350	0.179	0.088	
May	63	283	0.138	0.060	
June	26	137	0.056	0.042	

It should be noted that during the nine months for which the above record is given the city operated 204 (about 15 per cent) more lights than did the contractor during the corresponding period, and that the quantity of effective lighting was much greater, the city lamps burning at full 2,000 rated candle power, absorbing from 450 to 470 watts each, according to variations of temperature.

MAINTENANCE.

In the above statement of costs is included, in the items for general supplies and for labor, the expense of maintaining the plant in perfect condition at all times. The Commission's machine shop contains a lathe with 24-inch swing and 16-foot bed, a 20-inch drill press, an emery grinder, a blacksmith forge and the necessary tools and appliances for doing all the work usually done in machine shops. In the lamp repair shop is a turret lathe and a lathe for winding the magnet spools used in arc lamps. With scarcely an exception all repair parts for

machinery, lamps and switches are made in these shops, castings only being procured outside. A great deal of new work is also made here.

Boiler insurance to the amount of \$25,000 is carried, and there is in stock duplicate parts for the boiler feed pumps, the furnaces, and portions of the engines and dynamos.

FINANCIAL REPORT.

Detroit, Michigan, July 1st, 1896.

To the Public Lighting Commission:

Gentlemen—I present herewith a detailed statement of the financial operations of the Board for the fiscal year ended June 30th, 1896.

The appropriation for the Public Lighting Fund for the year just closed was \$158,276.25, of which amount \$32,675.00 was on account of construction. The total amount collected during the year by the Receiver of Taxes was \$148,942.75, but a considerable portion of the difference between the amount appropriated and the amount collected is taken care of by the item known as "city bids," which includes the back taxes collected during the year on appropriations made prior to 1894. In order to show the exact difference between the amounts allowed by the Board of Estimates and the amounts realized each year since the organization of the Commission the following table is given:

PUBLIC LIGHTING COMMISSION.

41

TAX COLLECTIONS, PUBLIC LIGHTING FUND.

Year ending June 30, 1894:

Tax levy.....	\$175,000 00
Amount collected	\$167,413 45
City bids	2,285 32
	<hr/>
	169,698 77
	<hr/>
Amount uncollected	\$ 5,301 23

Year ending June 30, 1895:

Tax levy	\$174,362 44
Amount collected	\$164,484 38
City bids	7,908 45
	<hr/>
	172,392 83
	<hr/>
Amount uncollected	\$ 1,960 61

Year ending June 30, 1896:

Tax levy	\$158,276 25
Amount collected	\$148,942 75
City bids.....	6,818 54
	<hr/>
	155,761 29
	<hr/>
Amount uncollected	\$ 2,514 96

Uncollected taxes for three years:

June 30, 1894.....	\$5,301 23
June 30, 1895.....	1,960 61
June 30, 1896.....	2,514 96
	<hr/>
Total	\$9,775 80

Following are statements of the receipts and disbursements for the year on account of the operating and construction funds:

OPERATING FUND.

Receipts:

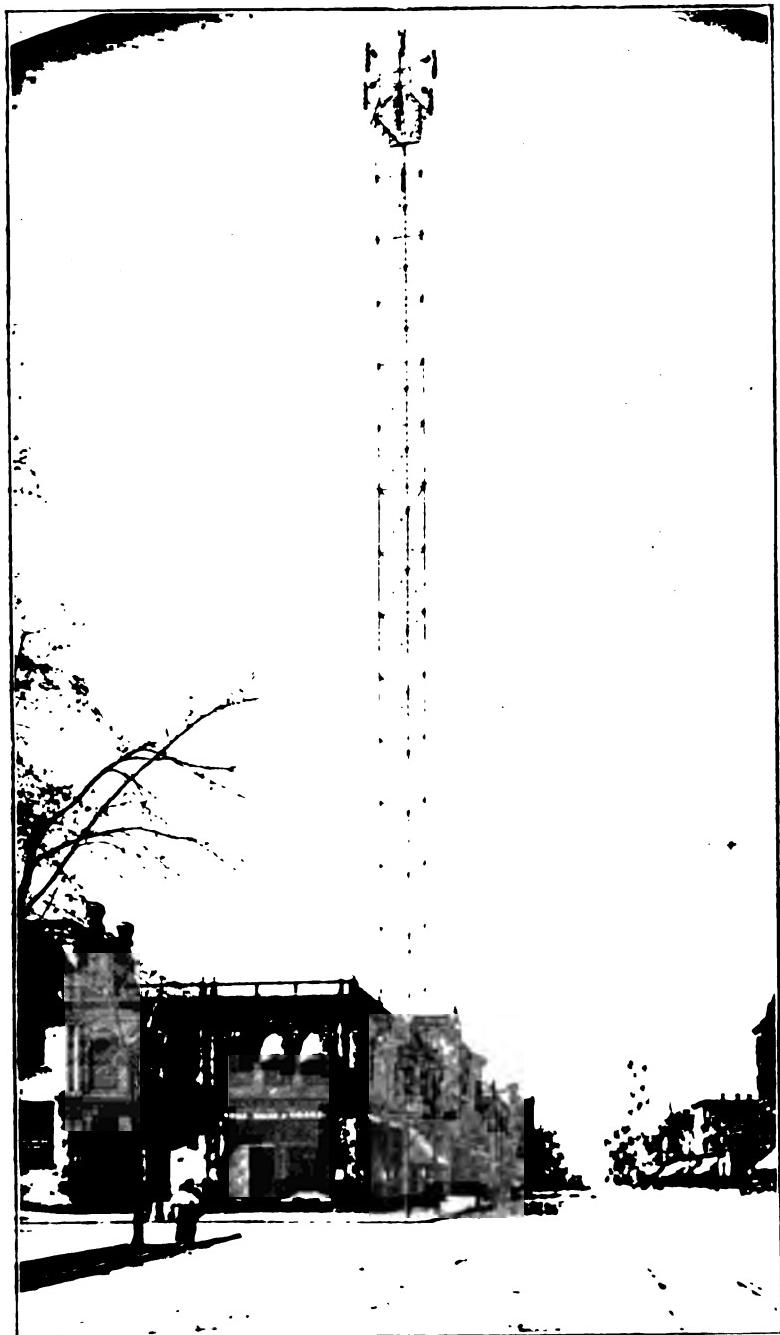
Balance in fund, July 1, 1895.....	\$ 8,122 60
From tax levy, 1895.....	\$116,267 75
From tax levy, 1894.....	1,357 87
City bids	5,560 67
	<hr/>
	\$123,086 29
	<hr/>
Total	\$121,208 89

Disbursements:

Pay rolls, labor and management.....	\$ 66,237 13
Printing and stationery.....	403 12
Oil and rags.....	1,635 09
Teaming	2,192 60
Fuel	14,379 14
Incandescent lamps	432 42
Globes and nets.....	617 73
Carbons	8,473 67
Detroit Electric Light & Power Co., lighting.....	28,796 41

General Supplies:

Brooms	\$ 18 90
Trimmers' belts, gloves and tools.....	225 85
Soap	30 40
Drug sundries and chemicals.....	148 67
Pressure gauges	11 52
Copper connectors	60 00
Current for testing lamps.....	14 28
Patrolemen's badges	6 00
Repairing dynamo covers	8 95
Hardware, iron and castings.....	880 78
Mineral wool and asbestos.....	8 25
Iron pipe and fittings.....	194 75
Shearlings	2 00
Transmission rope	81 00
Oil tank and pump.....	31 63
Street car tickets, freight and telegrams.....	275 51
Repairs to engine governor.....	87 54
Kerosene and gasoline	19 57
Carbon brushes	68 51
Brass castings	173 32
Metal polish	7 40
Alternating lamp	24 80
Mast arms	90 00
Wire cloth for arc lamps.....	80 24
Oil cans and measures.....	10 27
Arc lamp repair parts.....	149 10
Thermometers for feed water.....	13 50
Paints and brushes	62 60
Riveting boilers	35 88



TOWER LIGHT.



PUBLIC LIGHTING COMMISSION.

48

Repaving, Board of Public Works.....	2 40
Pump repair parts.....	42 65
Lettering buildings	10 00
Salt for railway track.....	7 65
Guy stub for line.....	8 75
Engine repair parts	8 55
Oil cups	41 25
Repairing electrical instruments.....	1 85
Wagon repairs	12 00
Rent of pole yard.....	75 00
Insulating tape and cement.....	96 42
Wire solder	4 71
Overhead wire	358 99
Gauge glasses, packing and gaskets.....	188 58
Wood and glass insulators	4 00
Extra water grates for furnaces.....	32 70
Crushed stone	5 78
Lumber	284 24
Electric fixtures and supplies.....	597 92
Malleable castings	36 50
Cross arms	40 68
Brick	6 00
Sand	2 20
Flue scrapers	15 00
Cement	2 68
	\$ 4,607 72

Office account:

Ice	\$ 29 76
Water	90 89
Gas	12 64
Furniture	4 70
Laundry service	70 50
Telephone service	137 20
Subscription, electrical papers	7 80
Rubber stamps	6 10
City map	20 00
City Directory	6 00
Boiler insurance	125 00
Surgeon and hospital charges	251 00
	761 59
Balance, June 30, 1896	2,672 27
	\$131,208 89

CONSTRUCTION FUND.

Receipts:

Balance on hand July 1, 1895.....	\$106,554 01
Appropriation, 1895	32,675 00
Incandescent lighting	\$ 7,901 28
Lighting Belle Isle bridge	90 00
Labor, other boards and railways.....	2,270 22
Sale of old material	146 89
Rent of lines and conduit	288 03
	10,701 37

\$149,930 38

Disbursements:

Real estate:

Paid on building contracts.....	\$ 25 00
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Steam plant:

Iron work and castings	\$ 104 19
Steam pipe and fittings	916 06
Fire pipe line	1,014 91
Oil purifier and tanks	96 00
Hot water meters	557 01
Condensers and fire pump	4,766 50
Stone work	5 64
Freight, etc.	9 56
Covering steam pipes	1,848 75
Steam packing	89 22
Engine indicators	529 75
Steam loops	468 75
Boiler room floor	317 73
Paid on boiler contract.....	18,500 00
Steam valves	70 38
Pay roll, labor	302 50
Transmission rope	309 75
Paid on engine contract.....	9,795 15
Paid on purifier contract	2,586 42
	37,288 27

Electric plant:

Freight	\$ 18 58
Lettering dynamos....	9 00
Incandescent machinery	8,798 00
Castings	79 20
Paid on dynamo contract	27,499 92
Electrical instruments	243 92
	36,648 63

Conduit:

Repaving, Board of Public Works.....	\$ 410 69
Wooden stakes	8 00
Pay roll, labor	1,501 71
Hardware, iron and castings	204 37
Rope and tackle	2 85
Crushed stone	339 50
Brick	117 00
Tools	5 43
Use of water	6 00
Lead covered cable	391 69
Oil for lanterns	2 00
Cement	426 15
Conduit tile	570 00
Teaming	351 35
Plumbing	17 22
Iron pipe for laterals	100 25
Sand and sewer crock	168 12
	4,622 33

Line construction:

Pole paint	\$ 405 13
Guy wire	304 62
Line wire	10,808 15
Tools	79 08
Connectors	100 00
Submarine cable	600 00
Arc cutouts	347 75
Pine poles	391 95
Freight and express.....	39 76
Pay roll, labor.....	7,754 99
Rent of pole yard.....	300 00
Cedar poles	4,653 95
Oil	2 86
Repairs to sidewalk.....	2 63
Sand and brick	18 80
Plumbing	25 63
Insulating tape	184 80
Hardware and castings.....	576 91
Line hardware.....	990 95
Mast arms	244 00

Line Construction—continued.

Insulators	105 00
Teaming	1,536 56
Electric supplies	156 58
Cross arms	261 24
	———— \$ 29,291 34

Lamp Posts:

Castings	\$ 218 38
Hospital fee, injured workman.....	2 00
Pine posts	176 00
Teaming	9 63
Inspection, Board of Public Works.....	5 00
Brick	18 00
Lumber	6 12
	———— \$ 435 13

Towers:

Hardware, iron and castings.....	\$ 273 03
Guy wire and strand.....	269 93
Wire and fittings	100 00
Insulators	53 25
Crushed and cut stone.....	51 00
Brick	69 60
Lumber	10 28
Pay roll, labor.....	1,765 31
Sand	20 20
Rope and tackle	120 54
Teaming	1,126 23
	———— \$ 3,859 37

Lamps:

Hardware and castings	\$ 148 83
Telephone message	1 50
Tools and supplies	37 44
Pay roll, labor	1,765 31
Series incandescent lamps	186 15
Paid on contract	26,441 10
Arc lamp suspensions.....	102 00
Fixtures	101 50
Teaming	106 00
	———— \$ 28,822 56



CENTER SUSPENSION LIGHT.

7

Machine shop:

Coal, blacksmith	\$ 14 75
Iron and hardware	158 88
Pay roll, labor	984 69
	<hr/>
	1,158 32

Railway track:

Steel rails	\$ 53 82
Labor, D., G. H. & M. Ry.	16 54
	<hr/>
	70 36

Engineering:

Street car tickets	\$ 40 00
Livery	2 00
Expert services, making tests.....	815 15
Travelling expenses	10 41
	<hr/>
	867 56

Central Station:

Paint and brushes	\$ 110 22
Castings, iron work and hardware.....	387 57
Electric fixtures	269 22
Glass	1 53
Freight	3 67
Paving and sodding grounds	1,014 30
Dock work	37 35
Lumber	378 56
Stone	28 10
Pay rolls, labor	1,988 99
Brick	45 00
Plumbing	1 25
Teaming	71 46
	<hr/>
	4,337 22

Miscellaneous:

Medical services	\$ 156 00
Advertising for proposals	43 51
	<hr/>
	199 51
Balance, June 30, 1896	2,504 79
	<hr/>
	\$149,920 38

Received vouchers covering all of the above expenditures are on file in the office of the City Controller, and a detailed list

of said vouchers will be found in his annual report for the fiscal year, ended June 30, 1896.

Very respectfully,

WILL F. CONANT,
Secretary.

Detroit, July 6th, 1896.

I have this day examined the cash account of the Public Lighting Commission for the fiscal year, beginning July 1, 1895, and ending June 30, 1896, and find that the total receipts were \$10,729.86. Of this amount the Secretary holds the City Treasurer's receipts for \$10,701.37, and has on hand cash to the amount of \$28.49.

JAMES T. STERLING,
Chief Accountant.



CRANE LIGHT.

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APPENDIX.

PUBLIC LIGHTING ACT.

AN ACT to amend an act, entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, by adding a new chapter thereto.

Section 1. The People of the State of Michigan enact, That an act entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, be and the same is hereby amended by adding a new chapter thereto to be known as chapter thirteen, to read as follows:

CHAPTER XIII.

Section 1. There shall be a board of commissioners in said city known as the public lighting commission. Said commission shall consist of six members, who shall be appointed by the mayor and approved by the common council. The first appointment of members of this commission shall be made at the next meeting of the common council after this chapter shall have become operative, and the first appointments shall be made for the terms respectively of one, two, three, four, five and six

years, and the members so appointed shall hold office until their successors are appointed and shall have qualified. Their successors shall be appointed at the termination of said respective terms for the term of six years. Said commissioners shall take and file in the office of the city clerk the oath of office prescribed for city officers, and shall then enter upon the performance of their duties. They shall appoint their president and secretary, who shall perform the duties usually appertaining to such offices and such as shall be prescribed by said board. The president of said board shall be ex-officio a member of the board of estimates. Said board of commissioners shall have authority to call upon the city surveyor for any services they may require in making maps or diagrams of locations of lights and wires within the city limits, and the city clerk and board of public works shall furnish them such information as they may require for the proper discharge of their duties.

Sec. 2. The said city may contract for the lighting of public buildings, streets, avenues, parks, public grounds and places for any period not exceeding three years. It shall have power to procure lands, and purchase or construct the necessary buildings, engines, dynamos, and other machinery, tools, lamps, lines, conduits, poles, towers and other apparatus and appliances, constituting a plant for lighting the said city by electricity, or by any other means or system, and if the common council deem it desirable it may purchase towers, poles, wires, lamps and other appliances, and cause lines of wire to be constructed, the use of which it may let to any persons or corporation contracting to light said city. It shall also have power to lay pipes and conduits in the highways, alleys and public places, for gas or electric light wires, and to erect in the highways, alleys, and public places, poles, towers, or posts for wires or lamps, and to place, construct and maintain the necessary lines of wires, either

below or above ground, in the highways, alleys or public places: Provided, That nothing in this act shall be construed as granting said municipality or said board the right to engage in the business of private or commercial lighting.

Sec. 3. If the common council shall determine to contract for lighting, it shall by resolution direct the public lighting commissioners to enter into a contract for lighting said city, either by electricity or by such other means as it may determine, for a period of time to be mentioned in such resolution. It shall thereupon be the duty of said commissioners to prepare specifications and advertise for proposals for a period of not less than five days, and enter into a contract in behalf of said city with the lowest responsible bidder, for lighting said city by such means as are specified in such resolution: Provided, It shall be competent for the commissioners to contract for lighting the public buildings and any part or portion of the city by different means or systems.

Sec. 4. If the common council shall determine that it is advisable to establish a plant for public lighting, to be owned by the city, it may direct said commissioners to purchase the necessary lands, machinery, wires, poles, lamps, towers and other apparatus and appliances mentioned in the second section of this chapter the cost of which shall not exceed eight hundred thousand dollars. And it shall thereupon be the duties of said commissioners without further approval or confirmation of their contracts by the common council, to carry into effect the authority thereby conferred, and to make the necessary purchase of lands, machinery, engines, tools, lamps, apparatus and appliances, and construct the buildings required, and cause to be constructed or laid all necessary conduits and lines of wire below ground, and to erect and construct all necessary poles, towers, posts, lines of wire above ground, which they shall deem

7

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years, and the members so appointed shall hold office until their successors are appointed and shall have qualified. Their successors shall be appointed at the termination of said respective terms for the term of six years. Said commissioners shall take and file in the office of the city clerk the oath of office prescribed for city officers, and shall then enter upon the performance of their duties. They shall appoint their president and secretary, who shall perform the duties usually appertaining to such offices and such as shall be prescribed by said board. The president of said board shall be ex-officio a member of the board of estimates. Said board of commissioners shall have authority to call upon the city surveyor for any services they may require in making maps or diagrams of locations of lights and wires within the city limits, and the city clerk and board of public works shall furnish them such information as they may require for the proper discharge of their duties.

Sec. 2. The said city may contract for the lighting of public buildings, streets, avenues, parks, public grounds and places for any period not exceeding three years. It shall have power to procure lands, and purchase or construct the necessary buildings, engines, dynamos, and other machinery, tools, lamps, lines, conduits, poles, towers and other apparatus and appliances, constituting a plant for lighting the said city by electricity, or by any other means or system, and if the common council deem it desirable it may purchase towers, poles, wires, lamps and other appliances, and cause lines of wire to be constructed, the use of which it may let to any persons or corporation contracting to light said city. It shall also have power to lay pipes and conduits in the highways, alleys and public places, for gas or electric light wires, and to erect in the highways, alleys, and public places, poles, towers, or posts for wires or lamps, and to place, construct and maintain the necessary lines of wires, either

below or above ground, in the highways, alleys or public places: Provided, That nothing in this act shall be construed as granting said municipality or said board the right to engage in the business of private or commercial lighting.

Sec. 3. If the common council shall determine to contract for lighting, it shall by resolution direct the public lighting commissioners to enter into a contract for lighting said city, either by electricity or by such other means as it may determine, for a period of time to be mentioned in such resolution. It shall thereupon be the duty of said commissioners to prepare specifications and advertise for proposals for a period of not less than five days, and enter into a contract in behalf of said city with the lowest responsible bidder, for lighting said city by such means as are specified in such resolution: Provided, It shall be competent for the commissioners to contract for lighting the public buildings and any part or portion of the city by different means or systems.

Sec. 4. If the common council shall determine that it is advisable to establish a plant for public lighting, to be owned by the city, it may direct said commissioners to purchase the necessary lands, machinery, wires, poles, lamps, towers and other apparatus and appliances mentioned in the second section of this chapter the cost of which shall not exceed eight hundred thousand dollars. And it shall thereupon be the duties of said commissioners without further approval or confirmation of their contracts by the common council, to carry into effect the authority thereby conferred, and to make the necessary purchase of lands, machinery, engines, tools, lamps, apparatus and appliances, and construct the buildings required, and cause to be constructed or laid all necessary conduits and lines of wire below ground, and to erect and construct all necessary poles, towers, posts, lines of wire above ground, which they shall deem

necessary or required according to such system or systems as they may deem best for the lighting of said city. (As amended January 17, 1895.)

Sec. 5. The said commissioners may employ an electrical engineer who shall be known as the city electrician, and such other superintendents, engineers, clerks, agents and subordinates under them as may be necessary to carry into effect the provisions of this chapter, regulate and define their duties and prescribe their compensation.

Before the common council shall direct said commissioners to establish a plant as herein provided, it shall by resolution submit to the electors of said city, to be voted upon by said electors, the question as to whether the authority hereby conferred shall be exercised. The proposition shall be stated upon the ballots to be printed by the election commissioners, in the following form: "For a city lighting plant—Yes," and the same words repeated followed by the word "No;" and any elector may vote for or against said proposition by marking a cross opposite said words "Yes" or "No," respectively. The votes upon said proposition and for and against the same, respectively, shall be certified, returned and canvassed by the board of city canvassers in the manner now provided by law for certifying, returning and canvassing votes cast for city officers. And if a majority of the electors voting thereon in said city shall vote in favor of said proposition then the authority hereby conferred may be exercised; otherwise the same shall not be so exercised. Notice shall be given by the city clerk by publication in four or more newspapers of the election to vote upon said proposition at least five days before the election.

Sec. 6. The said commissioners shall have a general supervision and management of all public lighting, and of any plant established by the city, as herein provided for that purpose, and

all employees engaged in or about the construction or operation thereof, and shall make the necessary purchase of fuel, tools, supplies, materials, apparatus and appliances required in the operation and management of said plant, without further approval or confirmation of their contracts by the common council: Provided, That the expenditures for the operation and management of said plant shall not exceed in any one year the tax levied for that purpose: And provided further, That after the adoption by them of plans and specifications for the erection of any buildings, the board of public works shall have the immediate supervision or superintendence of construction thereof, and also of the laying of conduits in the public streets, and of the necessary excavation, refilling and repaving caused thereby. (As amended January 17, 1895.)

Sec. 7. The said city may raise by tax the necessary funds to provide for the public lighting and for the purpose of providing for the construction of the public lighting plant, as herein provided, may raise moneys by tax or issue the bonds of said city, payable at such times and in such amount and at such rates of interest as the common council may determine, subject however to the approval of the board of estimates as provided by section 4, chapter 8, of act number 488 of the public acts of 1887. It shall also have power to issue bonds in like manner or raise moneys by tax for the purchase or construction of conduits, wires, posts, poles, towers and lamps, for use by any party or parties contracting for the public lighting as herein provided.

Sec. 8. No contract shall be let nor any purchase be made of any lands or property requiring the payment of any money, nor shall any moneys be paid for public lighting in excess of the tax levied for that purpose or of moneys raised by issuing bonds as herein provided.

Sec. 9. The public lighting commissioners shall have the supervision of the construction of all the electric lighting lines of wires

in said city whether owned by the city or by other parties, and of all connections made with any building or buildings, and no such wires or lines of wire shall be placed, laid, erected or constructed, nor shall any pole or post or conduit be laid, placed or constructed for such lines, nor any connection made with any building or buildings, except under such general regulations as they from time to time may adopt. They may prescribe the limits of the district or districts in said city, within which it shall not be lawful to erect poles and train wires for such lines above ground in any street or highway, and they may prescribe or determine the other street or streets in which it may be lawful to erect or construct such lines of wire above ground. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor and shall be punished accordingly.

Sec. 10. The common council shall have power to adopt ordinances not in conflict herewith, to carry out the provisions of this chapter and to regulate the use of electricity for lighting purposes in said city, and the training or using of wires therefor, and to regulate or prohibit the erection of poles in the streets of said city for such wires, or the training thereof.

Sec. 11. Any person who shall cut, break, injure or destroy any building, engine, dynamo or other machinery, or appliances, poles, posts, towers, lamps, wires or conduits erected, constructed or used for the public lighting of said city, whether owned by the corporation or by any party or parties contracting for the lighting of said city, with intent to prevent or interrupt the lighting of any public building, or any part or portion of said city, shall be deemed guilty of a misdemeanor, and shall be punished therefor by a fine of not less than twenty-five dollars nor more than one thousand dollars, or by imprisonment not exceeding two years, or by both fine and imprisonment in the

discretion of the court, and proof that the act was willful shall be *prima facie* evidence of such intent.

This act is ordered to take immediate effect.

Approved March 18th, 1893.

GENERAL LIGHTING ORDINANCE.

A GENERAL ORDINANCE authorizing the granting of permission to construct, maintain and operate poles, conduits, wires or other conductors for the purpose of furnishing electric lighting in the City of Detroit.

It is hereby ordained by the people of the City of Detroit:

Section 1. That any person or corporation carrying on a manufacturing business in the City of Detroit, and having surplus power applicable to the purpose, may apply to and receive a permit from the Public Lighting Commission to lay conduits, erect poles and place thereon or therein wires or other conductors for the purpose of furnishing electric lighting to any person or persons desiring the same, and within the district to be designated in the application to be made for such permit. Said Public Lighting Commission is hereby authorized to grant such permits for the laying of conduits, erection of poles, placing of wires or conductors thereon in the streets, alleys or other highways of the city; subject, however, to the conditions and restrictions imposed by this ordinance, and all other general ordinances now in force or which may hereafter be adopted concerning the same.

Sec. 2. The person or corporation to whom such permit shall be granted shall do no injury to any street, avenue, alley, lane,

park or public square, or to any shade trees, or in any manner disturb or interfere with any water or gas pipes, or with any public or private sewer now or hereafter laid or constructed by any authorized person, persons or corporations, or the wires and conduits of any telephone, telegraph or electric lighting or street railway company, or of the police, fire or lighting commission, and shall fully indemnify and save harmless the City of Detroit from any and all claims or damages for which said city might be made or become liable to pay by reason of the construction, maintaining, repairing or operating of said poles, conduits, wires, lamps or other conductors, or any apparatus connected therewith or otherwise arising from the use or possession of the rights and privilege granted, or from any neglect on the part of said corporation or person or its or his employes to comply with any of the ordinances of the City of Detroit, and especially shall indemnify the city against and assume all liability and damages which may arise, come or occur to the City of Detroit from any injury to persons or property from the doing of any work herein mentioned, or the neglect of any person or company or its employes to comply with any ordinance relative to the use of streets, or other public places, especially as to the putting up of lights or barriers at or around excavations, and the acceptance by the person, persons or corporation of such permit of this ordinance shall be an agreement by it to pay to the City of Detroit any sum of money for which the city may become liable from or by reason of such injury.

Sec. 3. All poles erected under such permit shall be firmly set in the ground next to and within the curbstone, so as to cause the least obstruction, in such manner and of such uniform height, size, color and material as shall be approved or designated by the Public Lighting Commission and Board of Public Works.

Sec. 4. All operating and conducting mains and wires of any such person, persons or corporation shall be thoroughly and securely insulated with a material of sufficient thickness and durability to protect them from abrasion and other mechanical injury, and impervious to water, to be approved by the Public Lighting Commission, and when laid beneath the surface of the ground, all conduits shall be laid in streets and avenues in a line parallel with the curb line thereof, at such distance from the curbstone, or where the curbstone should be as shall be designated by the Board of Public Works, and to a depth not exceeding two feet. It is especially required that all service wire used by such person, persons or corporation shall be connected only with a main laid in a conduit in the alley or at the side of the street nearest to the building into which it is desired to conduct such service wires.

Sec. 5. At least twenty-four hours before opening or excavating in any street, alley or any public space for the above or for any other purpose, said person, persons or corporation shall notify the Board of Public Works in writing of such desire, stating the place where and the object for which said opening is to be made, and obtain the permit of said Board, and in the opening and refilling of all openings and excavations made as aforesaid, the relaying of the pavements and other work necessary to the complete restoration of the streets, pavements, sidewalks or ground to equally good condition as when disturbed, the said person, persons or company or its servants or employes shall be under the supervision of the Board of Public Works or its authorized agents, and shall promptly comply with any order or resolution of said Board or its agents, or of the Common Council, in reference thereto. Nor shall any street, avenue or public space be allowed to remain open or incumbered for a longer period than shall be necessary to execute the work

for which the same has been opened. And the Board of Public Works or the Common Council may determine the question of such necessity.

The earth removed in making such excavation shall be restored and the pavement be relaid by said person or corporation in as good a condition as before the making of such excavation, and thereafter be maintained in as good condition as the surrounding pavement until the street or alley in each case is repaved. No excavation in any street, alley or public place shall be allowed to remain open or said street, alley or public place be encumbered for a longer period than shall be necessary to execute the work for which the same is made.

The cost of restoring the earth or otherwise, arising from such excavations and the laying of the pavements and repairs thereto, caused by the opening of any such street, alley or public place, shall be paid by said person or corporation, and said work shall be done under the supervision of the Board of Public Works, and the expense of such supervision shall be paid by said company, on presentation of bills, certified by said Board, and any expense to which the city shall be put from neglect of said company or its employes in the doing of any work, or the doing of the same in an unworkmanlike manner, of the digging of ditches or holes and erection of poles, or restoring the earth or any excavation, or relaying or replacing of any pavement, shall be paid in like manner by said company on presentation of the bills of cost certified by said Board, and it shall be the duty of said person or corporation in each instance, to promptly pay all bills for labor and material, supervision, etc., incurred by the Board of Public Works in relaying and restoring any pavement or surface disturbed by said person, persons or corporation, and if said bills, properly certified by the Board of Public Works, remain unpaid for the space of thirty (30) days after the presenta-

tion to said person or corporation, it shall be the duty of the Board of Public Works to pay over to the credit of the proper fund the amount of any bills so remaining unpaid from the guaranty money deposited by said person or corporation with said Board, and on refusal, neglect or failure by said person, persons or corporation to make such guaranty money good to its full extent as herein first named prior to the next meeting of the Common Council, the Board of Public Works shall report the facts in the case to the Common Council for such action by the latter body as is permitted or deemed proper under the terms of the ordinance.

Sec. 6. The Public Lighting Commission shall have the supervision of the construction of all electric light lines of wires erected in pursuance of the authority hereby granted, and all connections made in any public building or buildings, as provided by chapter 13 of the charter of the City of Detroit. In the lines of wires or the laying of any conduits as herein provided, said Lighting Commission shall prescribe or determine the street or streets in which it shall be lawful to erect or construct lines of wires above ground, and no person shall erect any pole or train any wire for such lines above ground in any street or highway excepting the same be authorized by such permit.

Any person violating the provisions of this section shall be punished by a fine not exceeding five hundred dollars, and in the imposition of such fine the court may make a further sentence that the offender be imprisoned in the Detroit House of Correction until such fine be paid, provided the term of imprisonment shall not exceed the period of six months.

Sec. 7. Any permit hereby authorized shall not become operative and authorize the construction of any line of wires above ground or the laying of any conduits until the person

or company to whom the same may be granted shall have filed with the City Controller a satisfactory bond, to be approved by the Controller, in the sum of twenty thousand dollars, conditioned that the person or corporation to whom such permit is granted will faithfully comply with and perform the terms and conditions of this ordinance; and such person or corporation shall also have deposited and shall keep on deposit with the City Treasurer, the sum of two hundred dollars to cover the expense of the replacing of the earth in making the repairs to pavements required to be relaid by such person or company under the provision of this ordinance, and as a guarantee for the prompt payment of any bills for such work presented by the Board of Public Works, such deposit shall be kept good to the amount of two hundred dollars, and on failure to keep the same good to that amount such permit shall become void.

Sec. 8. In addition to all usual and ordinary taxes and general or special assessments for which any such person, persons or corporation shall be liable, he or it shall annually on the first day of July pay to the City of Detroit, as part of the consideration for the rights herein conferred, the annual sum of one dollar for each pole erected and maintained by it, and also the sum of \$5 per annum for each and every mile of wire operated and maintained by it, computation thereof to be based upon each strand of wire, whether above or below the surface of the ground, said sum to be paid to the City of Detroit for the first year or portion of a year within one month after the construction and erection of such poles, and annually thereafter on the first day of July in each and every year in advance. And the bond mentioned above in section 7 shall be further conditioned for the payment of said sums.

Sec. 9. Whenever the Public Lighting Commission shall deem it for the public interest they may require, as a condition

to the issuing of any permit, that the wires shall be laid in the public conduits, and if any wires shall be strung on poles along any highway, and public conduits shall afterwards be laid therein, said commission may require the wires so strung upon poles to be taken down and put in the public conduit; and upon any refusal to do so, may remove the same. Said commission may prescribe the terms and conditions upon which the public conduits shall be used for such purpose.

Sec. 10. Any rights acquired under any such permit shall cease whenever the Common Council shall so direct, and all poles and wires shall thereupon be removed at the expense of the person or corporation erecting or controlling the same.

Sec. 11. When any wires erected under any such permit shall interfere with any wires of the Public Lighting Commission, or with any telephone or telegraph wires of the Fire Commission or of the Police Department, the Public Lighting Commission may direct the removal of the same, or such alterations in relation thereto as will obviate or prevent such interference. When any person or corporation shall have erected a pole on any portion of a street, it shall be subject to the condition that the Public Lighting Commission may authorize other persons to whom such permits may be granted, to use such pole already erected, and upon such terms and conditions as the Public Lighting Commission may direct.

Sec. 12. This ordinance shall take immediate effect.

Approved October 17, 1893.

FIRST ANNUAL REPORT

LIGHTING SYSTEM ORDINANCE.

AN ORDINANCE to protect the Public Lighting System.

It is hereby ordained by the people of the City of Detroit:

Section 1. That no person shall cut, break, injure, deface or destroy any building, engine, boiler, dynamo or other machinery or appliances, poles, lamp posts, towers, wires or conduits erected or constructed for the public lighting system of the city of Detroit.

Sec. 2. No person shall open or tamper with any manholes or handholes or any vault or junction box connected with the conduits of the public lighting system, nor shall any person, association, corporation, or company attempt to place or place any wires in said conduits, or upon the poles of said system without permission in writing from the Public Lighting Commission.

Sec. 3. No person, association, corporation or company shall post, paint, impress or in any way affix to any pole connected with the public lighting system of said city, or any box, lamp-post, tower, wire or other appliance connected therewith, any placard, sign, notice or announcement of any kind, or cause or allow any kite or other obstruction to become entangled with the wires, or apparatus of said system.

Sec. 4. Any violation of any provision of this ordinance shall be punished by a fine not exceeding one hundred dollars and costs; and in the imposition of any fine the court may make a further sentence that the offender may be imprisoned in the Detroit House of Correction until the payment thereof, for any period not exceeding six months.

Sec. 5. This ordinance shall take immediate effect.

Approved September 17th, 1895.

PUBLIC BUILDING ORDINANCE.

AN ORDINANCE relating to the lighting of public buildings.

It is hereby ordained by the people of the City of Detroit:

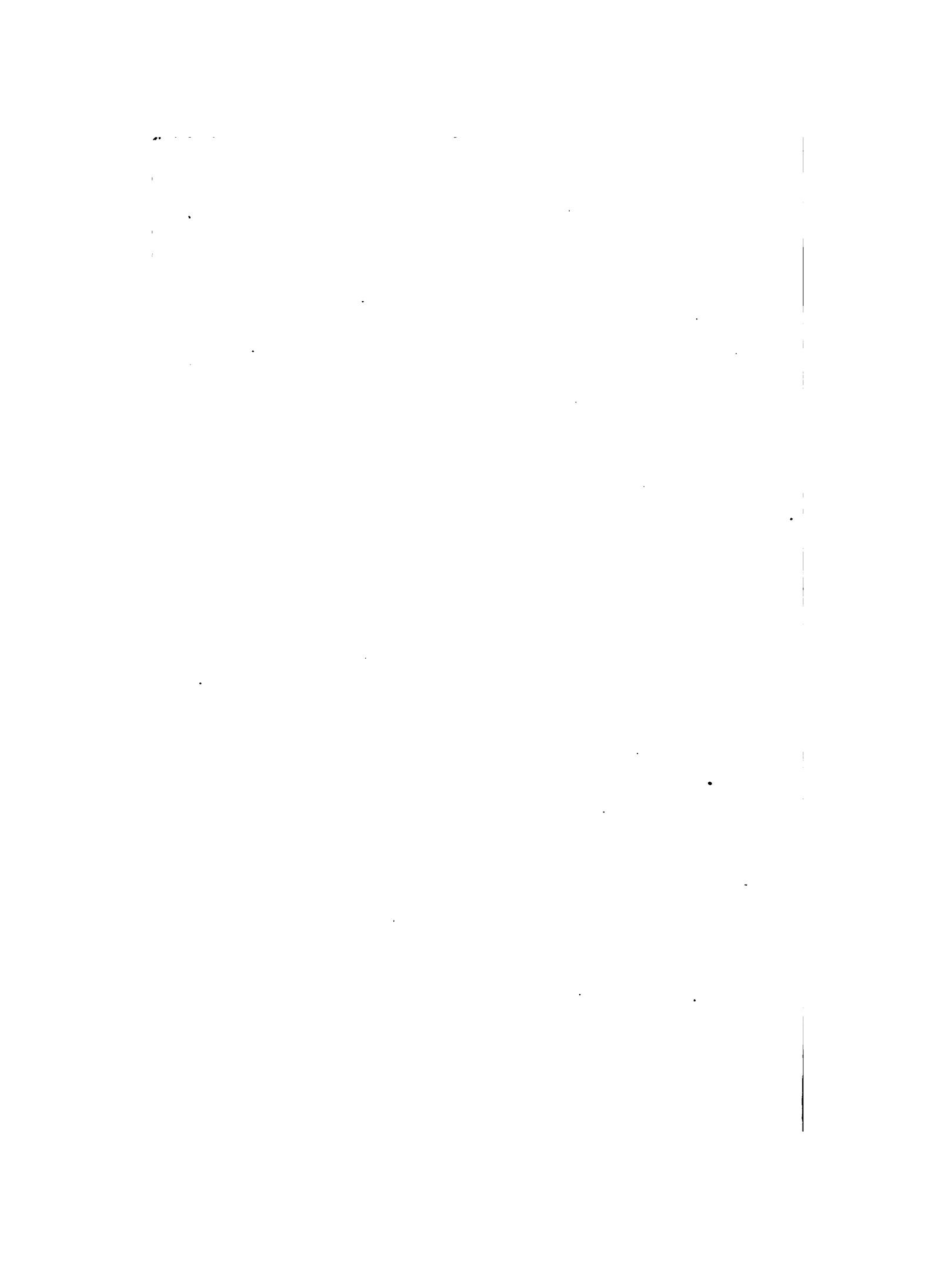
Section 1. That the city hall, municipal court building, all police stations, fire engine houses, house of correction, all public school buildings and all other buildings occupied by any of the several boards or commissions forming part of the government of the city of Detroit be and the same are hereby declared to be public buildings.

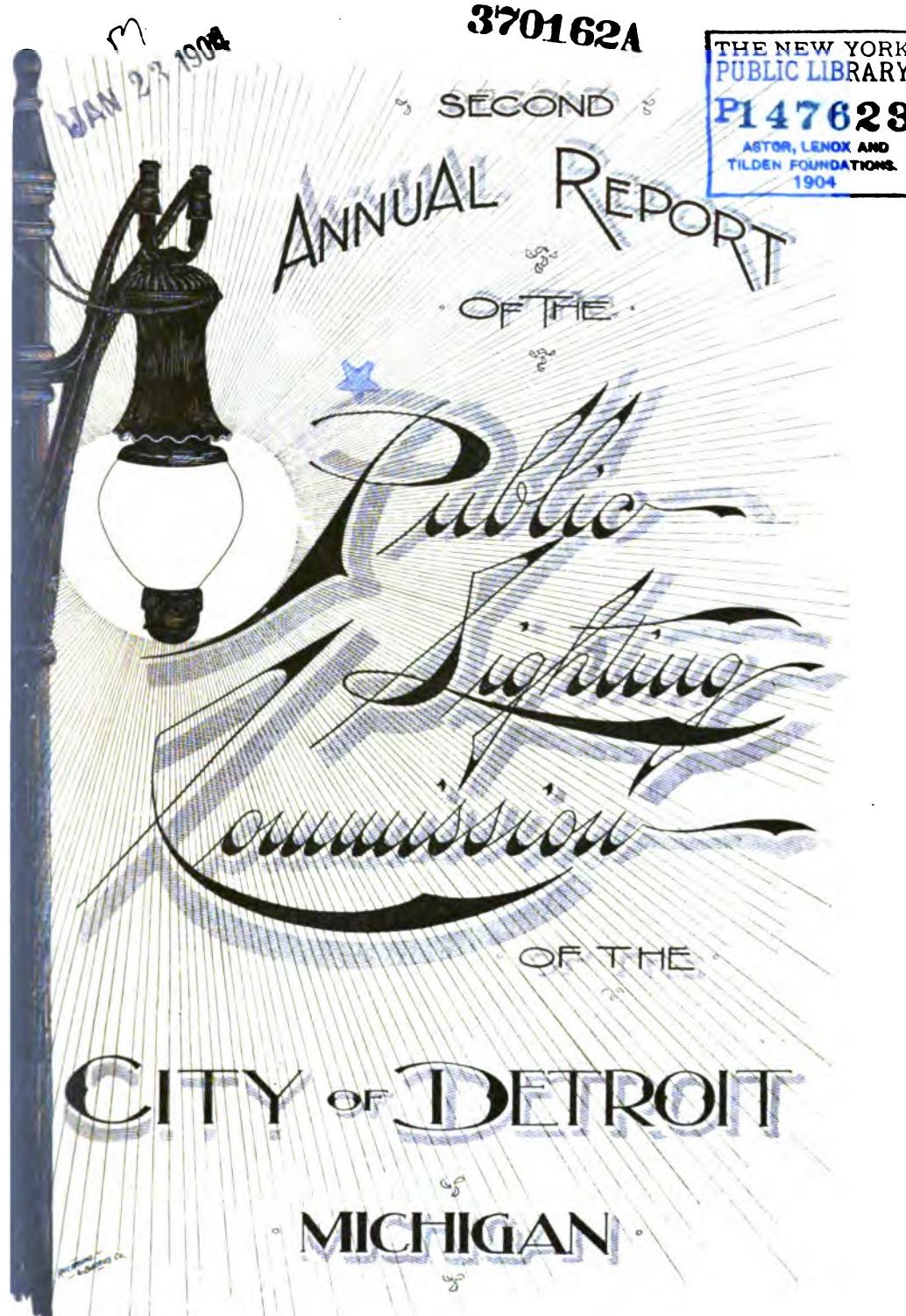
Sec. 2. It shall be the duty of the Public Lighting Commission to furnish the electrical current required for the proper lighting of all public buildings. Any electric current supplied by the said commission may be used in said buildings for the driving of ventilating fans or other similar appliances.

Sec. 3. During the remainder of the present fiscal year the expense of furnishing such electrical current shall be paid as heretofore by the common council or by the several boards and commissions using the same, but the public lighting commission shall include in their estimates hereafter the expense of such lighting of all public buildings or such of them as the board or commission in charge thereof shall require to be lighted.

Sec. 4. Whenever any new public building shall be constructed it shall be the duty of the board or commission in charge thereof to submit the plans therefor to the public lighting commission, and the said commission shall give such instructions as it may deem proper and necessary to insure the proper and safe wiring of such buildings and to supervise the same.

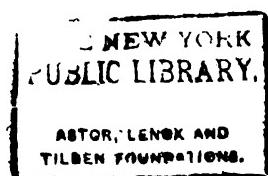
Approved December 12th, 1895.





FISCAL YEAR ENDING JUNE 30th 1897.

VGS



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...SECOND...

ANNUAL REPORT

OF THE

Public Lighting Commission

—OF—

THE CITY OF DETROIT

Fiscal Year ending June 30, 1897

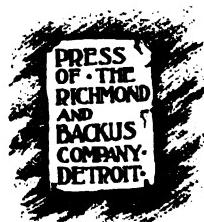
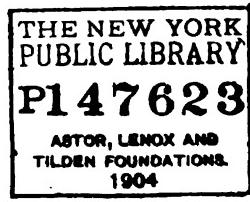
THE COMMISSION

J. L. HUDSON, <i>President</i>	TERM EXPIRES APRIL 4, 1898
JOHN ATKINSON, <i>Vice-President</i>	TERM EXPIRES APRIL 4, 1899
CHAS. H. RITTER, <i>Auditing Committee</i>	TERM EXPIRES APRIL 4, 1900
RICHARD H. FYFE, <i>Auditing Committee</i>	TERM EXPIRES APRIL 4, 1901
JOHN MINER, <i>Executive Committee</i>	TERM EXPIRES APRIL 4, 1902
WM. A. LIVINGSTONE, <i>Executive Committee</i>	TERM EXPIRES APRIL 4, 1903

*FORD STARRING, Secretary and Business Manager
W. D. STEELE, City Electrician and General Superintendent*

*Custodian of Funds - The City Treasurer
Auditor of Accounts - The City Controller*

{ ; /



OFFICE OF THE

Public Lighting Commission.

DETROIT, Aug. 2, 1897.

*To the Honorable,
The Common Council of the City of Detroit.*

Gentlemen:

The Public Lighting Commission respectfully submits for your consideration the accompanying report of the business intrusted to their care during the fiscal year ending June 30, 1897. In the report an effort has been made to present such data as will best convey an understanding as to the work done, the costs of Municipal Lighting and as to the condition of the city's investment.

We have the honor to be,

THE PUBLIC LIGHTING COMMISSION,

By J. L. Hudson, President,
By Ford Starring, Secretary.

CITY OF DETROIT**Common Council Chamber.****SEPTEMBER 1, 1897.****REPORTS OF COMMITTEES.****WAYS AND MEANS.***To the Honorable the Common Council.*

Gentlemen: Your Committee on Ways and Means, to whom was referred the annual report of the Public Lighting Commission for the fiscal year ending June 30, 1897, respectfully report that with the Chief Accountant we have examined the same, and believing it to be correct, recommend its approval.

Respectfully submitted,

WALTER H. COOTS,
NOBLE ASHLEY,
W. P. SUMNER,
WM. AUBERLIN,
BERNARD YOUNGBLOOD.

Accepted and adopted as follows:

Yea—Ald. Auberlin, Batchelder, Beck, Borck, Coots, Gerecke, Goeschel, Goldwater, Klein, McGraw, Merrell, Patterson, Reves, Schmitt, Schuette, Scullen, Stevenson, Sumner, Thompson, Tossy, Weiler, Youngblood and the President—23.

Nays—None.

JOHN L. BATCHELDER,
President Pro Tem.

JOHN A. SCHMID,
City Clerk.

Office of the Chief Accountant.

DETROIT, MICH., August 2, 1897.

*To the Honorable F. A. Blades,
City Controller, Detroit, Mich.*

Dear Sir:

I have the honor to submit herewith a detailed report of the receipts and disbursements as I find them on the books of the Public Lighting Commission, covering a period from the beginning of the Commission, April 4th, 1893, to June 30, 1897. The balances I find agree with those of the City Treasurer's Office.

The item "Accounts Receivable" I find to be the claim against the Commercial National Bank for the check amounting to \$651.48, wrongfully cashed by them to the former Secretary of the Commission.

I desire to say that I find the books of the Commission in admirable shape and so arranged as to enable the Commission to know at any date the cost of any or all details of the business.

Very respectfully,

J. T. STERLING,
Chief Accountant.

REPORT OF
The Chief Accountant.
PUBLIC LIGHTING COMMISSION.

Receipts, Disbursements and Balances.

April 4th, 1893, to June 30th, 1897

RECEIPTS.

From the City of Detroit:

Tax Appropriated, 1893.....	\$175,000 00
Balance of Lighting Fund, 1893.....	3,226 29
Bond Issue of 1893.....	600,000 00
From Contingent Fund, 1893.....	25,000 00
From Taxes Assessed prior to 1893.....	4,217 17
Tax Levy of 1894.....	174,362 44
" " 1895.....	158,276 25
Additional, acct. tax of 1895.....	2 02
Tax Levy of 1896.....	150,000 00
Bond Issue of 1896.....	50,000 00
Total from the City of Detroit.....	\$ 1,340,084 17

From other sources:

From Inspection Department.....	\$ 2,060 00
" work and material supplied other city	
departments.....	1,411 11
" sale of old material.....	3,538 49
" rent of conduits and poles.....	1,012 68
" lighting other departments.....	11,513 61
" accounts payable.....	16,745 27
Total from other sources.....	\$ 36,281 16
Total Receipts.....	\$ 1,376,365 33

DISBURSEMENTS.

Investment Accounts:

Conduits.....	\$ 72,870 69
Cables.....	31,182 19
Belle Isle Plant.....	7,821 85
Buildings and Wharf.....	109,096 61
Real Estate.....	63,125 00
Shop, Machinery, Tools, Etc.....	5,691 31
Lines.....	121,296 14
Towers and Posts.....	95,755 02
Steam Plant.....	101,789 24
Electric Plant, Arc.....	52,480 81
Electric Plant, Incandescent.....	11,220 80
Railway Track.....	9,935 60
Arc Lamps.....	46,955 47
Total Investment.....	\$ 729,222 73

Operating Accounts:

Operating or City Lighting Expenses, from April 4,
1893, to June 30, 1896.

Office Expenses.....	\$ 17,853 51
Advertising.....	319 16
Public Light from Private Companies.....	381,459 72
Fuel.....	17,162 20
Carbons.....	8,741 79
Pay Rolls.....	56,178 13
Printing and Stationery.....	403 12
General Supplies.....	4,366 37
Oil and Rags.....	1,637 85
Teaming.....	2,192 60
Incandescent Lamps.....	432 42
Globes and Nets.....	676 93
Total.....	\$ 491,423 80

Operating Expenses, 12 mos. to June 30, 1897.....	110,141 38
Inspection Department Expenses.....	2,292 88
Cost of Labor and Stores for other City Departments...	948 09
Increase in Stores.....	5,683 69
Accounts Receivable.....	651 48

Total Disbursements..... \$1,340,364 05

Total Receipts, as above.....	\$1,376,365 33
Total Disbursements, as above.....	\$1,340,364 05

Excess of Receipts..... \$ 36,001 28

BALANCES.

Balances, June 30, 1897:

City Treasurer.....	\$ 17,186 01
Secretary of Commission.....	333 96
Unpaid Taxes, 1893.....	460 40
Unpaid Taxes, 1894.....	1,610 32
Unpaid Taxes, 1895.....	2,700 67
Unpaid Taxes, 1896, real estate.....	8,219 99
Unpaid Taxes, 1896, personal.....	1,112 21

Worthless Taxes as follows:

Personal, 1893.....	1,227 77
Personal, 1894.....	1,264 53
Vessel, 1894.....	178 49
Vessel, 1895.....	157 11
Personal, 1895.....	1,542 15
Error in Collection, 1895.....	7 67
Total Balances.....	\$ 36,001 28

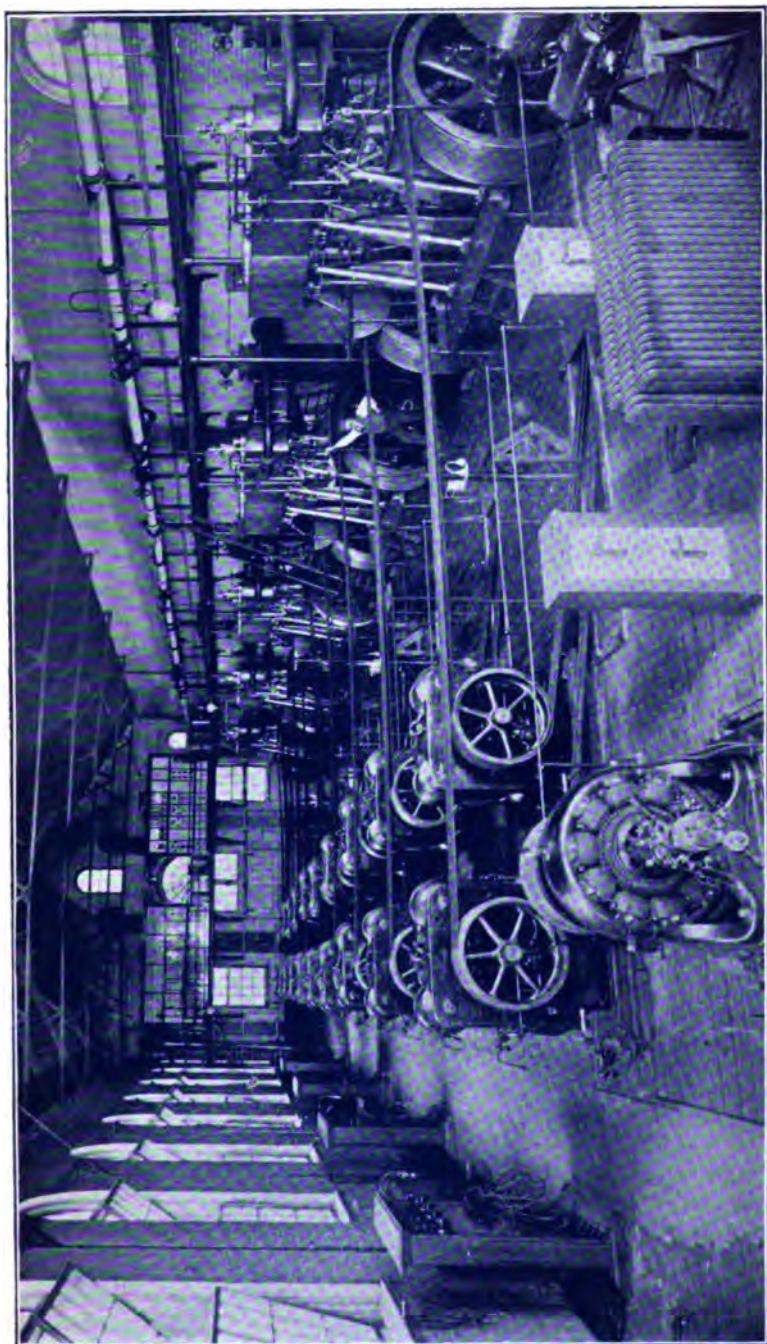
Assets and Liabilities, June 30, 1897.

ASSETS.

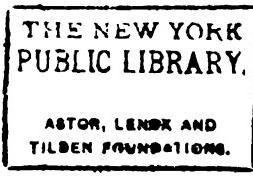
Stores.....	\$ 5,683 69
Accounts Receivable.....	651 48
In City Treasurer's hands	17,186 01
In Secretary's hands	333 96
Uncollected Taxes, 1893.....	460 40
Uncollected Taxes, 1894.....	1,610 32
Uncollected Taxes, 1895.....	2,700 67
Uncollected Taxes, 1896.....	9,332 20
Total.....	\$ 37,958 73

LIABILITIES.

Accounts Payable.....	\$ 16,745 27
Excess Assets.....	\$ 21,213 46



GENERATOR ROOM.



OFFICE OF

The City Treasurer.

DETROIT, July 10th, 1897.

Hon. J. L. Hudson,
President Public Lighting Commission, Detroit.

Sir: A statement of the Public Lighting funds for the fiscal year ending June 30, 1897, is as follows:

Balance July 1, 1896.....	\$ 5,177 06
Received from prior to 1896 taxes.....	304 39
" " tax bids.....	6,836 81
" " sundry deposits by the Secretary of the Com'n moneys received from sundry sources...	5,865 43
Rec'd from Bond Issue.....	50,000 00
" " 1896 taxes.....	140,667 80
Total Receipts.....	\$208,851 49
Vouchers Paid.....	191,665 48

Balance June 30, 1897.....\$ 17,186 01

I have the honor to be,

Yours truly,

L. B. LITTLEFIELD,
City Treasurer.

OFFICE OF THE

Public Lighting Commission.

STATE OF MICHIGAN, }
County of Wayne, } ss.

Ford Starring, Secretary of the Public Lighting Commission, being duly sworn, says, that the accounts of the Public Lighting Commission have been examined and verified by him from April 4th, 1893, to June 30th, 1897, and that the statements published herewith are statements drawn correctly from the books of the Commission.

(Signed)

FORD STARRING.

Subscribed and sworn to before me }
this 10th day of July, 1897. }

A. S. GUERIN,

Notary Public Wayne Co., Mich.

*To Hon. J. L. Hudson, President
Public Lighting Commission.*

Dear Sir:

We have carefully examined all disbursements vouchers for the year ending June 30th, 1897, and find them correct.

Respectfully yours,

C. H. RITTER,
R. H. FYFE,

Auditing Committee
Public Lighting Commission.

July 10th, 1897.

SECOND ANNUAL REPORT
OF THE
Public Lighting Commission
FOR THE
Fiscal Year Ending June 30, 1897.

The Public Lighting Commission of the City of Detroit was created by an act of the Legislature of the State of Michigan, approved March 18th, 1893. It provided for a Commission of six to be appointed by the Mayor of the City of Detroit, and approved by that city's Common Council. The full term of a Commissioner is six years. The Commission has general supervision and management of all public lighting. It has full authority in the employment of labor and the purchase of supplies, material and appliances. It has supervision of the construction of all electric light and power wires, whether owned by the city or by other parties; the connection of the same with any building; the setting of poles; the laying of conduits; of house wiring and of the general use of electricity.

The original commissioners were appointed April 4, 1893, and were as follows:

MARTIN BUTZEL,	- - - -	For one year.
C. A. NEWCOMB,	- - - -	For two year.
GEO. H. LOTHROP,	- - - -	For three years.
Wm. R. FARRAND,	- - - -	For four years.
J. L. HUDSON,	- - - -	For five years.
Wm. A. JACKSON,	- - - -	For six years.

The following changes in the Commission have taken place, Mr. J. L. Hudson being the only one of the original Commissioners at present a member of the Board:

R. H. Fyfe, succeeded C. A. Newcomb, July, 1893.
 Chas. H. Ritter, succeeded Martin Butzel, April, 1894.
 R. H. Fyfe, succeeded himself, April, 1895.
 Edwin Henderson, succeeded Geo. H. Lothrop, April, 1896.
 John Atkinson, succeeded Wm. A. Jackson, July 1896.
 John Miner, succeeded Edwin Henderson, December, 1896.
 Wm. A. Livingstone, succeeded Wm. R. Farrand, April, 1897.

**The Commission at the Present Time
Consists of**

J. L. HUDSON,	-	-	Term expires, April 4, 1898
JOHN ATKINSON,	-	-	Term expires, April 4, 1899
CHAS. H. RITTER,	-	-	Term expires, April 4, 1900
R. H. FYFE,	-	-	Term expires, April 4, 1901
JOHN MINER,	-	-	Term expires, April 4, 1902
Wm. A. LIVINGSTONE,	-	-	Term expires, April 4, 1903

The Ex-Members of the Commission Are

MARTIN BUTZEL,	-	-	Term expired April 4, 1894
C. A. NEWCOMB,	-	-	Resigned, July, 1893
GEO. H. LOTHROP,	-	-	Term expired April 4, 1896
EDWIN HENDERSON,	-	-	Resigned, Dec. 1, 1896
Wm. R. FARRAND,	-	-	Term expired April 4, 1897
Wm. A. JACKSON,	-	-	Resigned, July 14, 1896

The Events During the Fiscal Year Were

On July 1, Mr. Walter D. Steele was appointed City Electrician and Engineer in Charge, in place of Mr. Alex. Dow, resigned.

Commissioner Wm. A. Jackson resigned July 14th, 1896, because of the removal of his family and business to Chicago.

Hon. John Atkinson was nominated by Hon. H. S. Pingree, Mayor, and approved by the Common Council July 14th, 1896, to succeed Wm. A. Jackson.

August 11th, 1896, the Commission decided to put a stop to overhead wiring within certain districts and adopted the following resolution:

"By Commissioner Henderson: Resolved by the Public Lighting Commission of the City of Detroit, that it shall not be lawful to erect poles and train wires for electric lighting lines above ground in any street or highway embraced within the following described district: All that portion of the City of Detroit bounded on the south by Woodbridge street, on the east by St. Antoine street, on the north by Elizabeth Street, and on the west by Second street."

On August 1st, 1896, the Commission appointed Inspectors and assumed the duties placed on them by the ordinance approved July 28th, 1896, to regulate electric wiring and the use of electricity.

On November 23rd, the Commission was advised of the demise of ex-Commissioner Geo. H. Lothrop. The following sentiment was offered by Commissioner Atkinson and unanimously adopted:

"We have heard with deep regret of the death of our former associate Mr. Geo. H. Lothrop. Many of us were associated with him in the early days of the Commission. He was one of the first Commissioners appointed. His technical knowledge and good business judgment made him exceedingly valuable in the organization and work of the Commission. While he was absolutely independent in his views he was always considerate of the views of others, so that with every meeting he became more and more endeared to his fellow members. We wish to bear our testimony to his ability and integrity, as well as to his amiable and kind manner, and to tender to his afflicted family our heartfelt sympathy."

Commissioner Edwin Henderson resigned December 1st, 1896, that he might take the appointment as member of the Police Commission.

Hon. John Miner was nominated by Hon. H. S. Pingree, Mayor, and confirmed by the Common Council, December 1, 1896, to succeed Edwin Henderson.

W. F. Conant resigned the position of Secretary of the Commission January 19th, 1897, and Ford Starring was appointed to succeed him.

Commissioner Wm. R. Farrand's term of office expired April 4, 1897, and, although a re-appointment was tendered

him, he declined it owing to the condition of his health and the demands on him by his many business interests.

Wm. A. Livingstone was nominated by Hon. Wm. Richert, acting Mayor, and confirmed by the Common Council April 3rd, 1897, to succeed Wm. R. Farrand.

THE PLANT COMPLETED.

The close of the fiscal year June 30, 1897, saw practically the completion of the 2,000 arc lighting plant of the City of Detroit. While the entire system was constructed and the machinery installed prior to July 1st, 1896, yet there was much to be done in getting the many parts in satisfactory and harmonious working condition. Final adjustments in the machinery, in the lines and in the equipment, which only service can accomplish, have been made and everything brought to a condition approaching as near as possible to mechanical perfection.

Thus far the duties devolving upon the Commission have combined the care of the constructing as well as the operating of the plant. From now on the operating alone will command their attention and the problem of cheap electricity given undivided consideration.

THE CITY'S INVESTMENT.

The investment of the City of Detroit in its lighting plant now amounts to the sum of \$729,222.73, and it is electrically equipped for 2,000 arc lights of 2,000 c. p. and 3,000 incandescent lamps of 16 c. p. intensity. The City, however, is operating only a total of 1,600 arc lamps, the balance of the equipment being held as a reserve.

The investment, for convenience in figuring, can be divided into two parts, arc plant and incandescent plant, making the division in proportion to the electrical output for the year. The output for the year was 2,980,412 Kilowatt Hours, of which 2,716,628 were for arc and 263,784 were for incandescent lighting. In this proportion the investment can be placed at \$617,594.42 for the arc, and at \$56,850.99 for the incandescent plants, divided into the following costs:

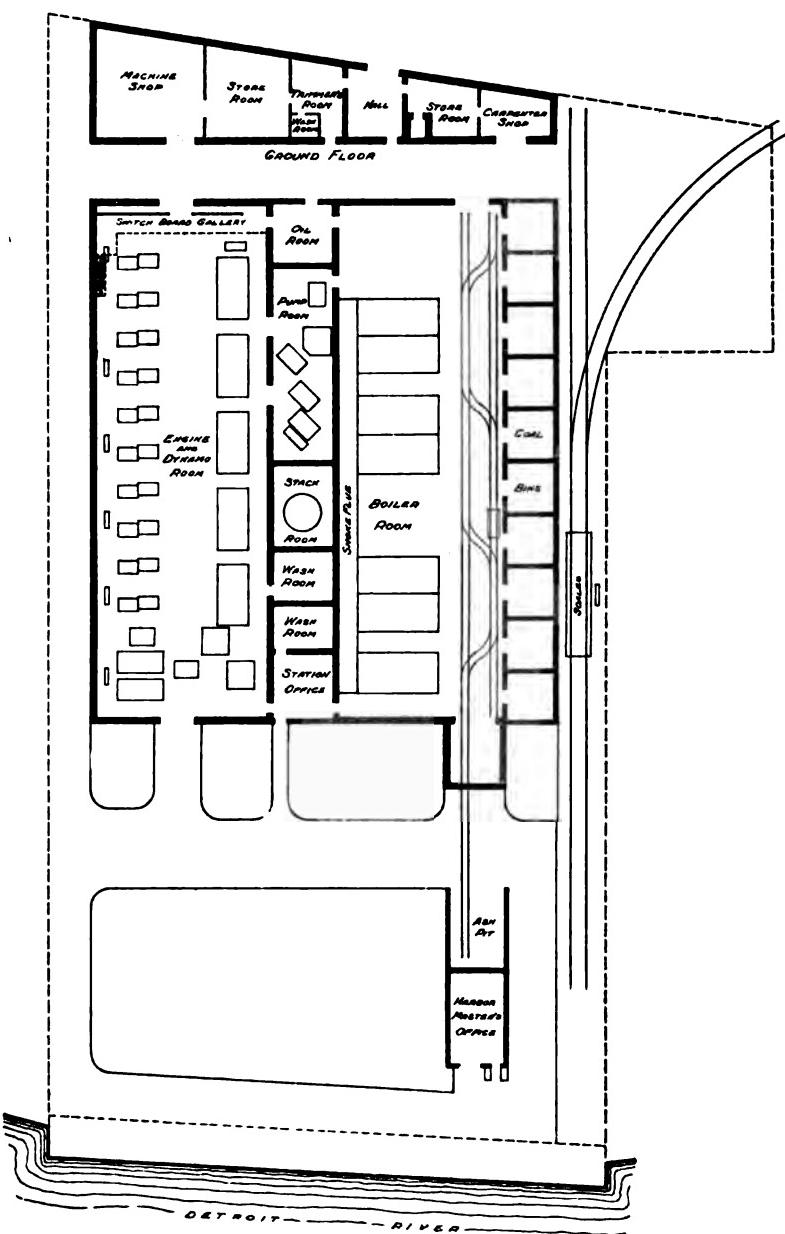
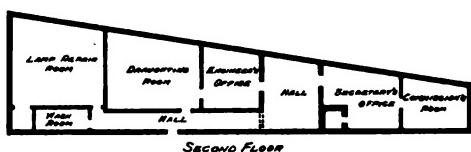
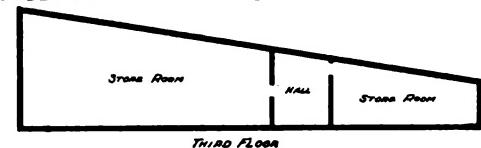
	ARC.	INCAND.	TOTAL.
Conduits	\$ 66,418.15	\$ 6,457.54	\$ 72,870.69
Cables	28,420.75	2,761.44	31,182.19
Real Estate	57,582.12	5,582.88	63,125.00
Bldgs, Wharf. Etc.	99,481.91	9,666.70	109,098.61
Lines	110,548.66	10,747.48	121,296.14
Towers and Posts	95,755.02	.....	95,755.02
Arc Plant	52,480.81	.....	52,480.81
Incandescent Plant .....	.....	11,220.80	11,220.80
Steam Plant	92,770.48	9,018.76	101,789.24
Railway Track	9,054.75	880.85	9,935.60
Machine Shop	5,186.77	504.54	5,691.31
Totals	617,594.42	56,850.99	674,445.41
Belle Isle Plant .....	.....	.....	7,821.85
Arc Lamps and Switches .....	.....	.....	46,955.47
Total Investment			\$ 729,222.78

Reducing the above costs to the cost per lamp, on the basis of the capacity of the plant, we have the following:

	ARC.	INCAN.
Conduits	\$ 38.21	\$ 2.15
Cables	14.21	.92
Real Estate	28.77	1.86
Buildings and Wharf.	49.72	3.22
Lines	52.27	3.58
Towers and Posts	47.88	.....
Steam Plant	46.89	8.00
Arc Plant	26.24	.....
Incandescent Plant .....	.....	3.74
Railway Track	4.52	.29
Machine Shop	2.59	.17
Arc Lamp and Switch	29.08	.....
Totals	837.88	18.98

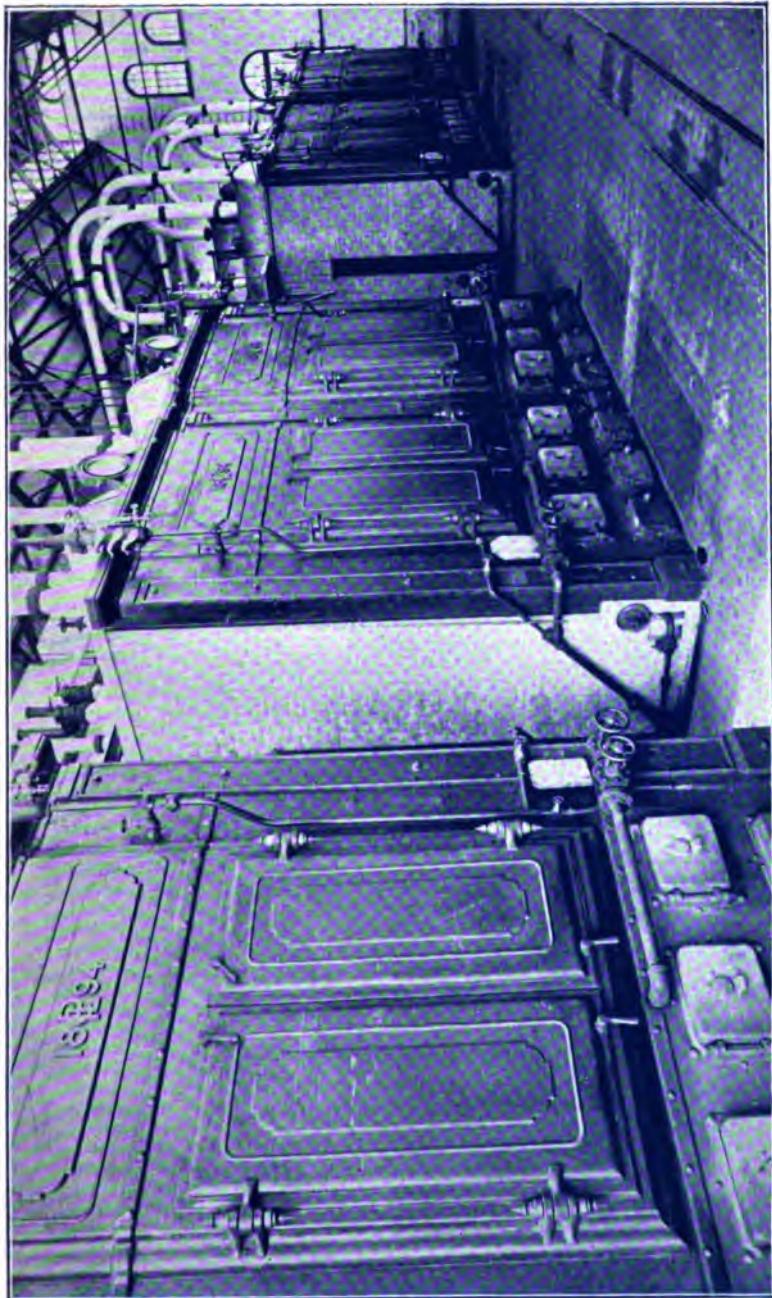
The arc lamps owned by the Commission are 1,500 double carbon Brush lamps and 115 single carbon Adams-Bagnall lamps, at a cost of \$46,955.47, or \$29.08 per lamp, including switches.

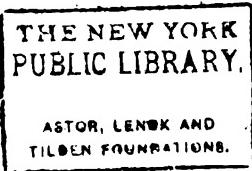
Examination of these figures shows the investment comparatively high in several items, and they may be explained by



GROUND PLAN OF PUBLIC LIGHTING PLANT.

BOILER ROOM





the fact that in the construction of the plant it was thought best to have a reserve in several departments. The boiler capacity, as compared with that of the engines and electrical machinery, has a surplus of fully 75 per cent. Only about 80 per cent. of the real estate has been occupied, while the buildings are elaborate and extensive. In conduits there is a surplus of 66 per cent. in space. Therefore, there can be a large increase of the electrical and engine capacity of the plant and at the same time make a marked reduction in the costs of the total investment per lamp.

The plant at the present time represents the following properties:

Boiler House:

Seven Double Deck Tubular Boilers, C. C. Peck design; each boiler has 3,000 sq. ft. of heating surface and is equipped with the Hawley Down Draft Furnace and Hoppes Live Steam Purifier and Worthington Water Meter. The coal is handled in one ton charging cars on a Hunt Industrial Railway. Coal bins of 800 tons capacity adjoin the firing floor.

Pump Room:

One Fire Pump of 1,000 gallons per minute capacity. This pump is connected to a complete system of fire mains and is always under steam. It is used during the day time to feed the boilers and to operate a water motor which runs the machine shop.

One Worthington Pressure Pattern Feed Pump, in reserve, of 100 gallons per minute capacity. This is connected to a duplicate boiler feed system.

Two Worthington Jet Condensers, with feed pumps attached. Either condenser will condense 36,000 pounds of steam per hour, and the auxiliary feed pump can feed the same amount of water to the boiler. All of the water used in the operation of the plant is pumped by the above machinery from the Detroit River.

One Berryman heater, which utilizes the exhaust steam from the pumps and small engines in heating the boiler feed water.

One Westinghouse Air Compressor, which supplies the compressed air for cleaning machinery.

Engine Room.

ARC LIGHTING PLANT.

Five triple expansion, marine type engines; 200 revolutions per minute, 160 pounds steam pressure; 25 inch vacuum; cylinders $11\frac{1}{4}$ inch, 18 inches and 29 inches in diameter, and 18 inch stroke; horse power at maximum efficiency, 340.

Twenty 50-Kilowatt; four pole, Western Electric arc dynamos for constant current at 9.6 amperes; speed 500 revolutions per minute. Four dynamos are driven by each engine, the connection being $\frac{7}{8}$ inch cotton ropes to each dynamo.

INCANDESCENT LIGHTING PLANT.

Three compound Westinghouse engines, run non-condensing; cylinders 9-inch and 15-inch, with 9-inch stroke; speed, 350 revolutions per minute.

Three 55-Kilowatt, 2-phase, Westinghouse alternators, belt driven. Alternators are run in parallel; 1,100 volts primary, 110 volts secondary.

Two excitors; one belt driven and one direct-connected to a Westinghouse standard engine.

Lines and Poles.

The overhead lines of the plant are strung on a total of 5,917 poles, owned as follows:

Public Lighting Commission	4,862
Fire Commission	504
Police Commission	390
Mutual Electric Lighting Co	59
Michigan Telephone Co.....	57
Detroit Street Railways	40
Edison Illuminating Co.	5
Total	5,917

The poles of the Public Lighting Commission are used by other parties as follows:

Fire Commission	547 poles,	1,007 contacts.
Police Commission	700 "	1,953 "
Edison Illuminating Co.....	98 "	389 "
Det. Electric Light and Power Co..	108 "	222 "
Mutual Electric Lighting Co.....	217 "	799 "
East Side Electric Co	36 "	70 "
Detroit Street Railways.....	266 "	for feeders.
" " "	218 "	for span wires.

The Public Lighting Commission has strung on poles a total of 365 miles of wire.

The Underground Service.

Within the half mile circle all the wires of the city are underground. The conduits vary in size from 4 ducts to 24 ducts, according to the possible demands upon them. The ducts are a special 3-inch vitrified tile laid in concrete.

The amount of conduits is as follows:

SIZE OF LINE.	LENGTH OF LINE.	FT. OF SINGLE DUCT.
4 ducts.	2,222 ft. 5 in.	8 889 ft. 8 in.
6 "	1,787 " 8 "	10,426 "
9 "	21,208 " 10 "	190,884 " 6 "
10 "	138 " 1 "	1,880 " 10 "
12 "	95 "	1,140 "
15 "	560 " 10 "	8,412 " 6 "
16 "	2,104 " 8 "	88,674 " 8 "
24 "	847 " 2 "	8,882 "
Manholes.	761 " 8 "	.....
Total.....	29,171 ft 4 in.	268,090 ft. 2 in.

Of lateral conduits constructed of $2\frac{1}{2}$ -inch lap welded iron pipe there are 36,606 feet.

The following lead covered, rubber insulated cables are used in connection with the conduit system:

No. 4 B. & S., in arc light circuits	108,221 ft.
No. 4 B. & S., in incandescent feeders	30,576 "
No. 8 B. & S., in incandescent light mains.....	24,738 "

THE ELECTRICAL OUTPUT.

The electrical output of the station for the year was a total of 2,980,412 Kilowatt hours, of which 2,716,628 were for arc and 263,784 were for incandescent lighting. The monthly output, with corresponding figures for the preceding year, is as follows, (last year the plant was not in full operation until October):

12 Mos. TO JUNE 30, 1897.				12 Mos. TO JUNE 30, 1896.			
Month	ARC.	INCAN.	TOTAL.	ARC.	INCAN.	TOTAL.	
July . . .	162,041	17,874	179,415	81,592	14,118	95,705	
August . . .	183,811	17,776	201,587	95,661	14,301	109,962	
Sept . . .	208,159	19,477	228,636	121,299	14,691	135,990	
October . . .	256,627	22,228	278,855	259,732	17,030	276,762	
Nov. . .	278,306	25,748	304,054	285,967	19,630	305,597	
Dec . . .	308,811	30,201	338,812	301,777	22,283	324,059	
January . . .	295,881	28,689	324,070	288,556	24,900	318,456	
February . . .	247,877	22,508	269,880	242,921	21,344	264,265	
March . . .	248,959	28,898	267,847	236,098	20,718	246,801	
April . . .	200,011	20,696	220,707	188,567	18,386	206,938	
May . . .	177,582	18,350	195,882	164,892	16,980	181,672	
June . . .	158,813	17,854	176,167	150,875	16,808	166,688	
Total . . .	2,716,628	263,784	2,980,412	2,407,232	220,653	2,627,885	

EMPLOYEES AND COMPENSATION.

In handling so extensive a plant a large force of employees has been necessary. The work has been carefully divided into departments and skilled foremen and capable men assigned to each. The average number of employees was 113. The division of the work and the compensation to regular employees was as follows: The length of time of work is 48 hours per week, requiring in the operating department a relief force.

Office.

1 Secretary	\$1,800.00
1 Book-keeper and Cashier	600.00
1 Messenger and Clerk	300.00
1 Store Keeper	600.00
1 Asst. Store Keeper and Janitor	625.00

Inspection.

2 Inspectors	900.00 each,	1,800.00
1 Permit Clerk		720.00

Engineering.

1 City Electrician	\$1,800.00
1 Civil Engineer.....	900.00
1 Draughtsman.....	780.00
1 Clerk.....	480.00

Operating.

STEAM MACHINERY.

4 Engineers	\$1,000.00 each,	4,000.00
2 2nd Engineers	720.00 "	1,440.00
7 Firemen	600.00 "	4,200.00
7 Oilers	480.00 "	2,360.00
1 Coal Passer.....		640.00
1 Laborer.....		470.00

ELECTRICAL MACHINERY.

4 Electricians.....	900.00 each,	3,600.00
3 Dynamo Tenders.....	360.00 "	1,080.00
1 Special Dynamo Tender.....		480.00

TRIMMING AND PATROLLING.

1 Head Trimmer...	900.00
27 Trimmers	730.00 each, 21,170.00
2 Patrolmen, with horses	1,140.00 " 2,280.00

Maintenance and Repairs.

BUILDINGS AND MACHINERY.

1 Master Mechanic	1,500.00
1 Machinist.....	864.00
1 Machinist Helper.....	600.00
1 Latheman	780.00
1 Blacksmith	780.00
1 Blacksmith Helper	470.00
1 Carpenter Helper.....	600.00
1 Carpenter	625.00
1 Painter and General Helper	600.00
1 Rigger and Track Man	720.00
1 Boiler Room Helper, Brick Mason.....	550.00
3 Laborers	480.00 each, 1,440.00

Overhead Lines.

1 Superintendent	900.00
1 Chief Lineman.....	1,000.00
3 Linemen	700.00 each, 2,100.00

Lamps, Cables and Incandescent Lighting.

1 Inspector	\$1,000.00
1 Coppersmith and Lamp Repairer	625.00
1 Lamp Repairer.....	625.00
1 Helper	470.00
1 Wireman	780.00
1 Wireman.....	700.00
1 Helper	470.00

Underground Conduits.

1 Inspector	900.00
1 Helper	470.00

Towers.

1 Inspector.....	1,000.00
1 Towerman	700.00
3 Helpers.....	700.00 each, 2,100.00
105 Totals.....	\$ 76,394.00

Of the 124 employees who have registered since January 1st, 1897, the ages ranged from 19 to 62 years, with the average at 33 years. The nativity of the employees was:

America	77
Canada	14
Germany	15
England	8
Scotland	6
Poland	1
France	1
Austria	1
Ireland	1
Total	124

COST OF OPERATING AND MAINTAINING.

The cost of operating and maintaining the plant, for the purpose of affording comparisons, have been classified under the subdivisions, Maintenance, Executive, Station, Trimming, Shop, Injuries and Damages.

The operating and maintenance expenses for the year, divided into labor and stores and classified as above, were as follows:

OPERATING AND MAINTAINING DISBURSEMENTS—FISCAL YEAR ENDING JUNE 30, 1897.

	First Six Months.			Second Six Months.			Total, for Twelve Months		
	Wages	Stores	Total	Wages	Stores	Total	Wages	Stores	Total
MAINTENANCE ACCOUNTS—									
Buildings, Wharf, Track	106.32	106.32	568.82	120.57	704.39	683.22	226.89	810.71	
Steam Plant	405.85	898.73	998.22	647.69	1,045.91	1,481.60	1,053.04	2,544.64	
Electric Plant	212.46	855.98	418.58	101.75	606.38	1,027.09	434.21	1,461.29	
Tools and Machinery	205.48	205.48	143.44	183.71	34.15	143.44	404.19	516.63	
Conduits	11.89	721.52	548.87	84.57	683.44	1,258.50	93.48	1,864.96	
Towers and Lamp Posts	383.80	1,694.08	1,725.40	636.78	2,362.18	3,090.63	975.58	4,056.26	
Arc Lamps	450.11	1,676.86	1,865.58	281.90	3,147.48	3,092.83	782.01	3,824.84	
Lines and Cables	561.96	4,080.84	2,463.88	437.91	2,911.20	5,982.36	999.87	6,982.23	
Total Maintenance.	7,917.52	2,322.37	10,239.89	8741.29	2,599.88	11,341.17	16,658.81	4,923.25	21,581.06
EXECUTIVE ACCOUNTS—									
Salaries, City Electrician and Secy	2,000.00	2,000.00	1,700.00	280.84	280.84	1,700.00	3,700.00	3,700.00	
Printing and Stationery	701.24	701.24	630.00	569.92	49.79	589.71	1,199.92	963.08	962.08
Store Room	630.00	1,296.00	994.73	1,043.96	1,043.96	2,390.73	197.79	1,219.71	
Clerks and Office Expense	1,296.00	840.00	858.07	88.47	891.54	1,683.07	49.23	2,389.96	
Civil Engineering and Drafting	840.00	840.00	840.00	308.33	4,486.05	8,883.72	38.47	1,781.54	
Total Executive Expense.	4,796.00	701.24	6,467.24	4,117.72	308.33	4,486.05	8,883.72	1,069.57	9,953.29
STATION EXPENSE ACCOUNTS—									
Oils	860.52	860.52	860.52	585.03	585.03	585.03	1,445.55	1,445.55	
Waste	165.18	165.18	8263.95	85.50	85.50	250.68	250.68		
Coal	8,263.95	8,263.95	8,263.95	184.35	8,268.85	8,458.20	184.35	16,532.80	16,717.15
Miscellaneous Supplies	1,3860.11	1,3860.11	1,3860.11	713.54	322.64	1,036.18	713.54	1,682.76	2,396.29
Wines	10,812.11	10,812.11	9,154.59	9,154.58	9,154.58	19,966.69	9,154.58	19,966.69	19,966.69
Total Station Expense.	10,812.11	10,649.76	21,461.87	10,052.47	9,203.02	19,314.49	20,864.58	19,911.78	40,776.36
TRIMMING EXPENSE ACCOUNTS—									
Lamps	48.00	11,863.00	11,864.00	24.76	11,388.76	23,189.00	677.76	23,266.76	
Carbons	3,580.28	3,580.28	3,580.28	8,537.77	3,537.77	7,118.05	7,118.05		
Renewals	281.31	281.31	281.31	381.02	381.02	662.33	662.33		
Lamp Expense	36.00	390.00	205.80	189.88	393.68	595.80	189.88	785.68	
Gloves and Nets	273.25	273.25	87.18	219.65	219.65	492.90	492.90		
Miscellaneous Expense	87.18	87.18	87.18	8.48	8.48	95.66	95.66		
Total Trimming Expense.	12,215.00	4,265.02	16,481.02	11,569.80	4,361.56	16,981.36	23,784.80	8,626.58	32,411.38
SHOP EXPENSE ACCOUNTS—									
Wages, Master Mechanic, etc.	3,119.66	3,119.66	1,425.75	173.73	173.73	4,545.41	662.38	4,545.41	
Supplies	498.05	488.66	3,608.81	1,426.75	1,426.75	4,545.41	662.38	662.38	
Total Shop Expense.	3,119.66	488.65	3,608.81	1,426.75	1,426.75	4,545.41	662.38	5,207.79	
INJURIES AND DAMAGES—									
Miscellaneous	178.00	178.00	13.50	20.00	20.00	38.50	13.50	198.00	211.50
Total Operating and Maintenance.	38,880.29	18,605.04	57,435.38	35,920.53	16,755.52	52,706.05	74,750.82	85,390.56	110,141.38

These expenditures, reduced to percentages in the different departments between labor and stores, furnish the following table:

DEPARTMENT	Wages	Stores	Total
Maintenance	15.18	4.45	19.58
Executive	8.06	.96	9.02
Station	18.95	18.00	37.04
Trimming	21.61	7.88	29.44
Shop	4.18	.60	4.78
Injuries and Damages	01	.18	.19
Total	67.89	32.11	100.00

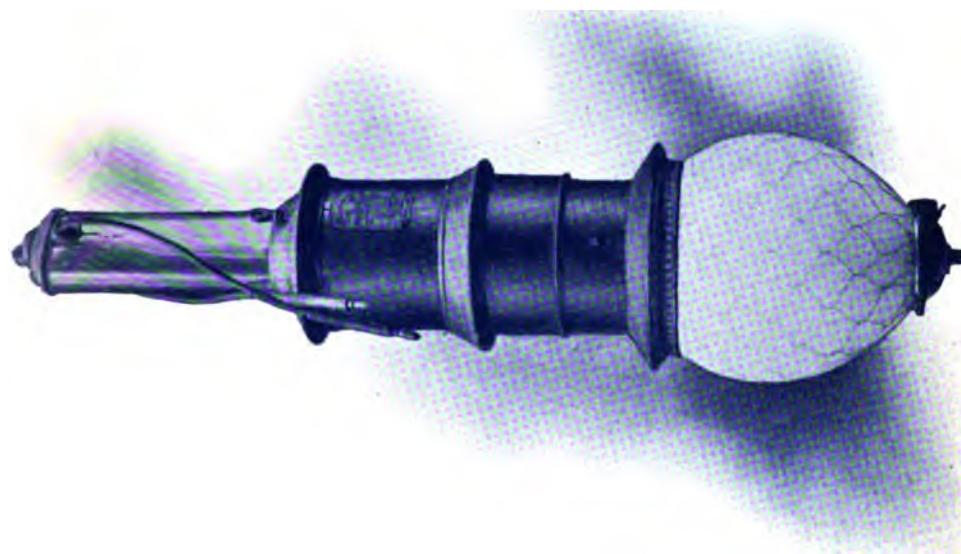
The year's expenses can also be reduced to the cost per Kilowatt hour and give valuable comparative figures. The results with comparisons are as follows:

ACCOUNTS	Jan. 1897	Feb. 1897	March 1897	April 1897	May 1897	June 1897	6 m. to Dec. 31, 1896	6 m. to June 30 1897	12 m. to June 30 1897
Maintenance ..	.00569	.00693	.00890	.00950	.00795	.00898	.00668	.00780	.00724
Executive ..	.00208	.00807	.00282	.00889	.00355	.00444	.00358	.00808	.00883
Oils .....	.00045	.00040	.00041	.00081	.00044	.00036	.00056	.00040	.00049
Waste .....	.00005	.00004	.00005	.00006	.00007	.00008	.00010	.00006	.00009
Coal .....	.00551	.00516	.00571	.00617	.00632	.00651	.00542	.00581	.00561
Mis. Supplies ..	.00082	.00029	.00056	.00007	.00088	.00083	.00089	.00050	.00070
Labor .....	.00571	.00622	.00560	.00668	.00738	.00870	.00709	.00651	.00681
Total Station ..	.01204	.01211	.01268	.01334	.01504	.01648	.01406	.01328	.01870
Trimming .....	.00855	.00916	.01026	.01231	.01850	.01465	.01081	.01096	.01088
Shop .....	.00161	.00118	.00080	.00084	.00098	.00107	.00286	.00110	.00174
Accident .....	.00004	.00000	.00000	.00000	.00000	.00005	.00011	.00002	.00007
Total, 1897.	.08002	.08248	.08541	.08928	.04102	.04567	.03763	.05624	.03696
Total, 1896.	.08034	.08401	.04281	.04278	.04704	.05187	.....	.08979	.....

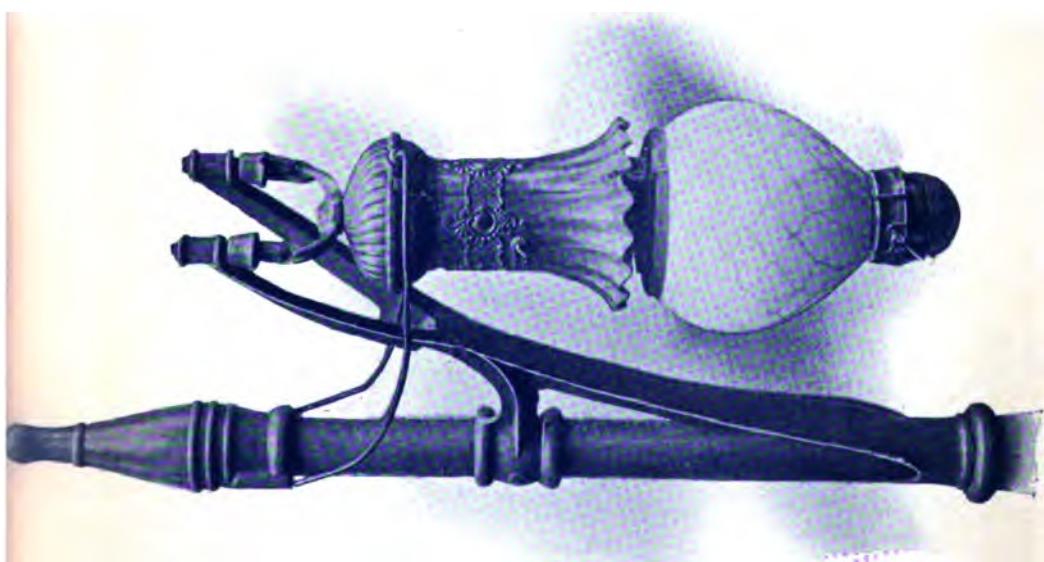
FUEL.

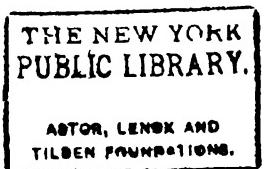
The heaviest item in stores expense is that for fuel. Lump coal of a superior grade is used. In computing coal consumed, the engineers' logs show for the fiscal year, 14,872,190 lbs. used in actual work, and 160,040 lbs. used in firing up or in differences in shippers' weight, the coal having been purchased on mine weights. The comparative figures for the previous fiscal year were 13,002,830 pounds used in actual work and 111,701 lbs. used in firing and differences in shippers' weights. A comparative table of the two years showing the

LAMPS ON TOWERS.



LAMPS ON POSTS.





amount of coal purchased per month and the amount actually used per Kilowatt hour, is as follows:

	12 Mos. TO JUNE 30, 1897		12 Mos. TO JUNE 30, 1896	
	Lbs. of Coal Bought	Lbs. used per K.w. hour	Lbs. of Coal Bought	Lbs. used per K.w. hour
July.....	954,510	5.33	874,815	6.85
August.....	1,028,980	5.08	888,490	6.10
September.....	1,171,060	5.10	815,980	5.90
October.....	1,864,250	4.89	1,266,695	4.58
November.....	1,488,440	4.87	1,884,096	4.58
December.....	1,619,860	4.82	1,512,610	4.67
January.....	1,487,550	4.56	1,440,920	4.60
February.....	1,220,170	4.53	1,241,040	4.70
March.....	1,407,170	5.10	1,196,415	4.85
April.....	1,188,500	5.84	1,046,250	5.10
May.....	1,090,550	5.49	957,470	5.27
June.....	1,021,690	5.80	880,500	5.28
Total.....	15,082,280	4.99	18,114,581	4.95

COST OF ARC LIGHTING.

The year's operating expenses can be divided between the Arc and the Incandescent in proportion to the electrical output. That chargeable to Arc Lighting would be \$100,393.15, which amount reduced to the cost of an arc lamp for one year shows the following relative figures:

Department	Wages	Stores	Total
Maintenance.....	\$ 9.71	\$ 2.87	\$ 12.58
Executive.....	5.18	.62	5.80
Station.....	12.16	11.61	23.77
Trimming.....	18.86	5.08	18.89
Shop.....	2.65	.38	8.08
Injuries and Damages.....	.01	.11	.12
Totals.....	48.57	20.62	64.19

While the foregoing figures represent the cash outlay for

an arc lamp for one year, they do not represent the total cost to the City.

The entire equipment is maintained in the best possible condition of repair, so that the cost chargeable to depreciation is reduced to a minimum. The only part that in time will have to replaced in an entirety is the boilers, and experience has shown that their life should be 20 to 25 years. Four per cent. of their cost is therefore added to the cost of a lamp or \$1.85 to the cost of an arc and 12 cents to the cost of an incandescent lamp.

The amount of the investment of the city for the year was \$714,843.76, having an interest value at 4 per cent. of \$28,593.75 per annum. Furthermore had the plant been a private enterprise it would have paid the City its proportion of taxes. That this might be calculated the Honorable the Board of Assessors placed an assessed value on the City Plant at \$427,500.00. Computing the taxes of 1896 on this valuation at \$15.54 for the City and at \$3.13 for the State and County for each \$1,000.00 of assessed valuation and we have the annual loss to the city in taxes of \$7,981.43. The city has thus lost through municipal ownership a total of \$36,575.18 of interest and taxes. Proportioning this in accordance with the electrical output and we have \$33,338.91 for the arc and \$3,236.27 for the incandescent costs. This additional arc expense being reduced to the single lamp for one year and we have \$18.28 for interest and \$5.10 for taxes, which added, with the depreciation, to the cash cost given above, makes the total cost of an arc lamp to the City of Detroit for one year \$89.42.

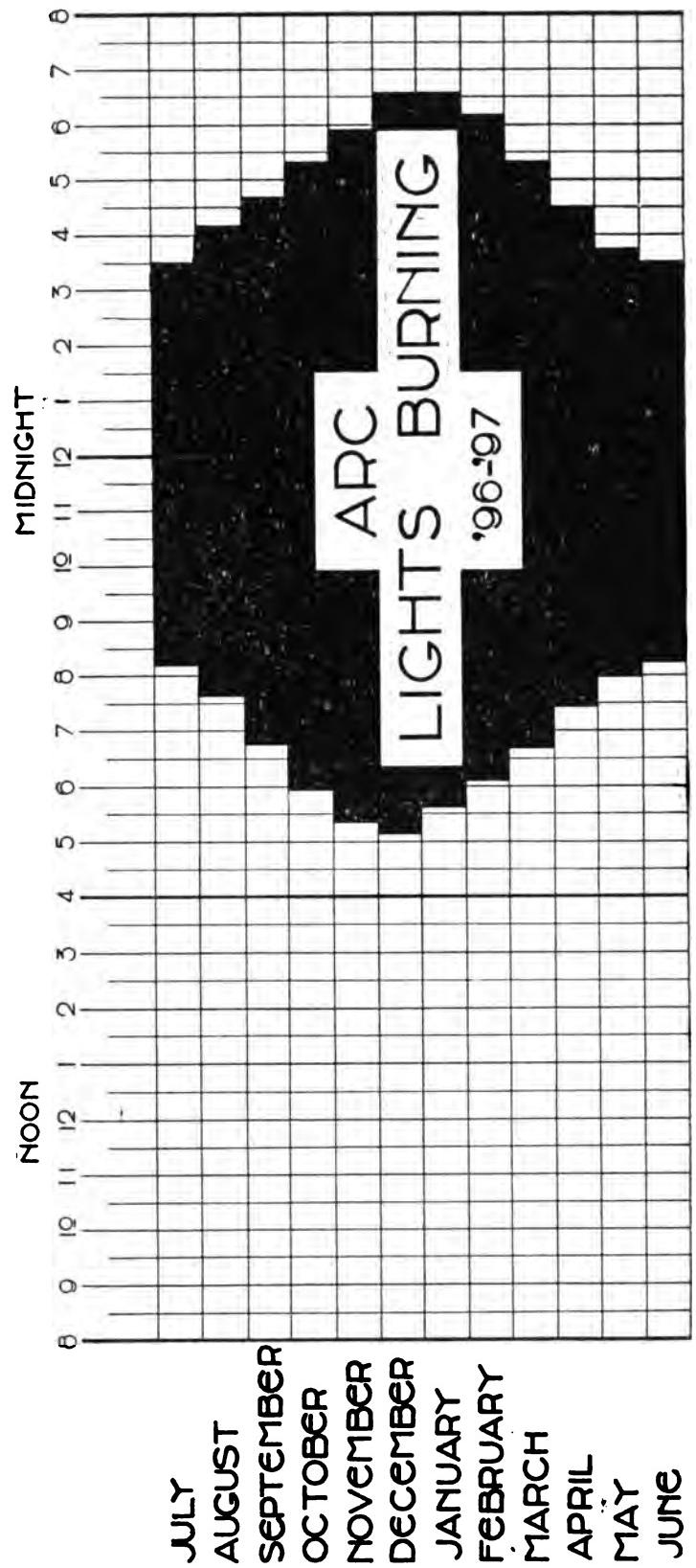
Lest unfavorable comparison may be made with the above costs of \$89.42 with the \$87.40, the cost used in the preceding report of this Commission, attention may be called to the fact that the latter figure was made up of \$68.52 cash outlay as compared with \$64.19 for this fiscal year; and also last year there was no attempt to figure a depreciation or loss of taxes, and interest was figured only on the bonded indebtedness, which was much short of the actual investment.

ARC LIGHTING.

The arc output was used to light a daily average for the year of 1,564 lamps of 2,000 standard candle power intensity. The lights were burned on the all night schedule, burning an average of 10 hrs. 23 min., July being the shortest month with an average of 7 hrs. 13 min., and December the longest month with an average of 13 hrs. 30 min. The arc lighting machinery was in operation a total of 3,790 hrs. 55 min., distributed by months as follows:—

MONTH	Total hrs. Operated	Average hrs. per night
July.....	238:25	7:32
August.....	264:95	8:32
September.....	301:15	10:02
October.....	357:05	11:31
November.....	385:15	12:50
December.....	419:05	13:30
January.....	406:45	13:07
February.....	342:25	12:14
March.....	388:45	10:55
April.....	277:45	9:15
May.....	246:25	7:57
June.....	218:10	7:28
Total	3,790:55	10:23

It has been a noteworthy fact that the lights of the City production burn with greater brilliancy than did those obtained from private corporations. The amount of current used in the city lamps is maintained at 96 amperes. The number of "lamps out" an accurate account of which is kept by the Police Department as well as by this Commission, has become much less since the City took the control. A comparative report on the number of lamps lighted, the total hours scheduled, and the total number of "lamps out" is given herewith:



	12 MONTHS TO JUNE 30, 1897.			12 MOS. TO JUNE 30, 1896.		
	Average Number Lamps	Total of Lamp Hrs. Scheduled	Total of Lamp Hrs. Out. Hrs. M.	Average Number Lamps	Total of Lamp Hrs. Scheduled	Total of Lamp Hrs. Out. Hrs. M.
July.....	1,484	840,188	184:34	* 700	168,257	2,426:88
August	1,492	889,958	288:58	* 727	191,322	1,889:02
September	1,512	449,801	98:28	* 814	242,598	4,239:28
October	1,562	551,868	157:54	1,446	519,462	1,040:10
November	1,585	604,805	88:19	1,488	577,075	778:84
December.....	1,590	660,023	80:01	1,498	629,018	940:29
January	1,594	642,115	98:22	1,498	607,517	871:88
February	1,589	587,788	78:18	1,481	510,790	801:80
March	1,589	580,845	95:22	1,479	476,000	234:41
April.....	1,590	484,804	217:19	1,479	896,065	849:41
May	1,589	985,932	82:54	1,477	846,849	288:18
June	1,593	845,243	18:48	1,480	816,291	148:05
Total.....	1,564	5,878,295	1,371:07	1,298	4,976,989	12,948:09

*There were also in operation 590 lamps supplied by contract.

†Includes the entire "out" of the city including contract light.

The causes of "lamps out" are summarized as follows:

MONTH	LINE TROUBLE		LAMP TROUBLE		TRIM'RS NEGLECT		TOTAL	
	Lmps	Hrs. M.	Lmps	Hrs. M.	Lmps	Hrs. M.	Lmps	Hrs. M.
July ...	16	65:48	8	18:29	7	50:17	26	134:84
Aug ...	58	208:11	7	84:31	7	51:11	64	288:58
Sept....			11	46:58	8	49:55	19	96:28
Oct....			12	81:52	9	76:02	21	157:54
Nov....			5	26:53	6	61:26	11	88:19
Dec....			8	22:24	10	57:87	18	80:01
Jan....			4	34:52	5	57:30	9	92:22
Feb....			2	22:47	7	50:31	9	73:19
March..	1	9:09	5	45:22	7	40:41	18	95:22
April...	83	124:54	2	18:89	14	77:46	49	217:19
May....			1	8:18	5	29:41	6	83:54
June....			1	7:15	1	6:38	2	18:48
Total...	108	408:02	56	858:15	88	609:10	242	1,371:07

The 1,600 lamps now lighted are distributed in a total of 1,237 locations so as to light the 17,564.67 acres which comprise the territory of the City of Detroit. The lights are placed on towers, posts or center suspension as the conditions demand. The style of fixtures and number of lamps are as follows:

SECOND ANNUAL REPORT.

800 Cranes	800 lamps.
136 Center Suspension	136 "
86 Posts, single lamp	86 "
4 Posts, double lamps	8 "
48 Mast Arms	48 "
8 Pole Tops	8 "
18 Indoor Work	18 "
56 3-Light Towers	168 "
70 4-Light Towers	316 "
2 6-Light Towers	12 "
<hr/> 1,237 Locations	<hr/> 1,600 "

The size and assessed values of the different wards of the City of Detroit, and the number of lamps in each make the following table:

WARD	ACREAGE	TOTAL ASSESSED VALUE 1897	LAMPS
1	1,072.89	\$ 86,023,570	175
3	786.28	7,829,150	79
5	686.86	8,631,460	78
7	686.48	6,875,280	85
9	875.78	7,998,640	87
11	646.14	6,894,740	79
13	1,070.61	6,859,820	74
15	8,711.54	14,078,750	185
 Total East Side ...	 9,315.45	 \$94,179,910	 792
 2	 836.96	 55,774,310	 160
 4	 937.44	 14,625,480	 102
 6	 780.58	 9,281,440	 96
 8	 991.79	 8,278,420	 101
 10	 979.68	 7,409,640	 99
 12	 980.79	 6,829,860	 74
 14	 1,175.86	 6,194,080	 99
 16	 1,456.59	 4,807,880	 77
 Total West Side ...	 8,149.19	 \$112,645,960	 808
 Grand Total.....	 17,564.67	 \$306,825,870	 1,600

TRIMMING.

One of the largest items of expense in connection with arc lighting is that of trimming. There are employed to do this work one head trimmer and 27 trimmers. The work is divided among the men so as to make the daily tasks about the same. Each man is held responsible for the good service of the lamps on his circuit and there is strife among them to hold the best records.

The work allotted to each circuit is as follows:

No. of Route	LAMPS ON			TOTAL LAMPS	LENGTH ROUTE MILES
	TOWERS	POLES	CENTER SUSPENSION		
1	42	25	0	67	4
2	32	34	1	67	4.67
3	24	34	9	67	4.67
4	4	37	22	63	5.75
5	8	44	10	62	5.75
6	7	36	18	61	6.50
7	10	46	7	63	7.50
8	20	19	24	68	7
9	32	21	6	59	8
10	18	31	11	60	7.50
11	21	30	0	51	9.50
12	15	42	1	58	9
13	10	45	2	57	9
14	11	35	18	59	9
15	21	31	0	52	9.50
16	17	34	11	62	8.50
17	4	46	10	60	7.50
18	26	30	4	60	8.50
19	14	28	18	60	8
20	32	25	0	57	9
21	18	40	1	59	8.50
22	18	32	9	59	9
23	23	29	6	58	9
24	24	32	1	57	9
25	18	38	0	51	10.50
26	27	25	0	52	9
27	4	46	6	56	10
To'tls, 27	495	915	190	1,600	218.84
Ave. 1	18	34	7	59	7.96

INCANDESCENT LIGHTING.

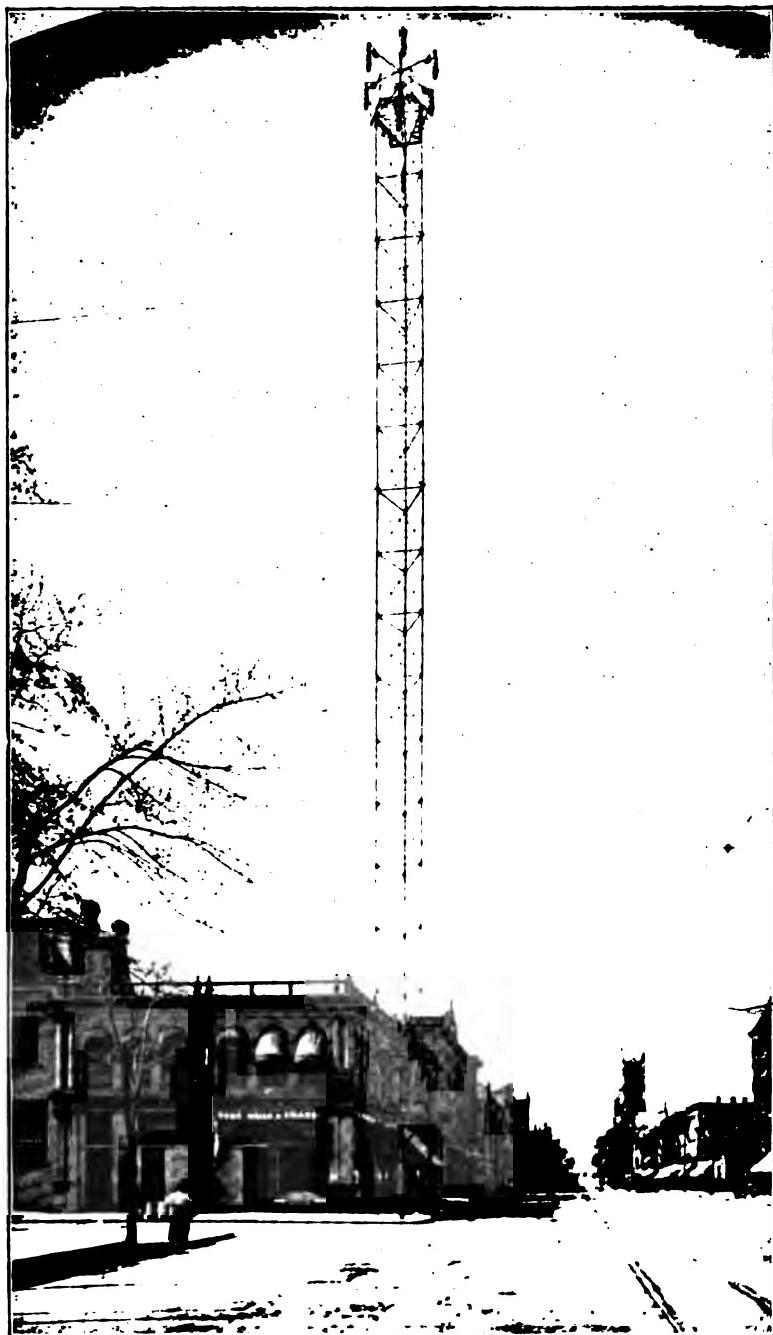
The incandescent output for the year was 263,784 Kilowatt Hours, at a total cost to the city of \$12,984.50, made up of \$9,748.23 cash outlay and \$3,236.27 for taxes and interest. Allowing for energy expended in transmission and transformers the output can be safely figured at 14.5 lamp hours to the Kilowatt Hour. This has been verified by count of lamps burning in a specified time. This makes a total lamp hours of 3,824,868, or at a cost of \$0.0034 per lamp hour.

The city is now lighting 19 of its buildings, the same being wired for a total of 3,064 lamps of 16 c. p. intensity. The buildings and number of lamps in each are as follows:

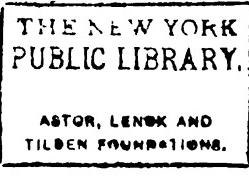
Public Lighting Station and Offices.....	277
City Hall and County Offices	753
Public Library.....	898
Municipal Court Building	327
Board of Health Offices	40
Water Board Offices.....	78
Police Headquarters, Central Station.....	166
Police Headquarters, East Side	100
Woodbridge St. Police Station	28
Police Barns.....	73
Fire Department Headquarters, Engine House No. 1.....	155
Fire Department, Telegraph Station	80
Engine House No. 2	19
Engine House No. 3	84
Engine House No. 6	45
Engine House No. 8	48
Engine House No. 9	16
Hook and Ladder House No. 2	17
Chemical Engine House No. 2	14
 Total Lamps	 3,064

THE INSPECTION DEPARTMENT.

This department, acting under the ordinance passed and approved July 28th, 1896, to regulate electric wiring and the use of electricity, began operations, August 1st, 1896. Considerable opposition has been met with on the part of property owners who did not appreciate the benefits in the way of pro-



TOWER LIGHT.



tection of life and property which would accrue from protection from defective wiring and other electrical construction. The rules under which inspections are made are in conformity with those used by the United States Fire Underwriters Association and of other cities having similar inspection departments.

The city has been divided into two parts, the east and the west sides, and an inspector placed in each. The department is expected to be self-sustaining. The work of the department since its beginning has been as follows:

No. Applications for Inspection	No. of Permits Issued	No. Ap- proved and Certificates Issued	Fees Collected	Expenses
August	172	172	\$ 59.50	\$ 182.95
September	197	197	187.25	160.00
October.....	216	216	149.50	160.00
November	175	175	162.00	160.00
December.....	177	177	159.75	198.78
January	156	156	172.00	246.25
February	147	147	151.25	230.20
March	213	213	219.00	268.75
April	221	221	239.25	228.50
May	287	287	307.75	227.75
June	222	222	258.75	239.75
Total.....	2,133	2,133	\$2,060.00	\$2,292.88

THE RENTAL OF POLES AND CONDUITS.

It is the policy of the Commission, wherever possible, to rent to other parties the use of pins on the poles or of ducts in the conduits of the city.

On April 13th, 1897, the following were adopted as the annual rates to be charged for the use of the pins on the city's poles:

For Light or Power Wires.

No. 8 Wire or less.....12½ cents per pin.
No. 4 Wire or larger.....15 cents per pin.

Commission to furnish cross arms and pins.

For Telegraph or Telephone Wires.

1 Wire	12½ cents per pin
2 Wires.....	25 cents per two pins.
3 " .....	.85 " three "
4 " .....	.45 " four "
5 " .....	.55 " five "
6 " or a 6-pin cross arm.....	.30 cents.
10 " or a 10-pin cross arm.....	.80 "

The lessee to furnish the cross arms and pins.

On May 25th, 1897, the following rules were adopted relative to the rental of conduits:

RULES RELATIVE TO RENTAL AND USE OF CONDUITS.

**Adopted by the Public Lighting Commission, of Detroit,
May 25, 1897.**

Sec. 9, Chap. 142, of the Revised Ordinances of the City of Detroit of 1895, provides as follows:

"Whenever the Public Lighting Commission shall deem it for the public interest they may require as a condition to the issuing of any permit that the wires shall be laid in the public conduits, and if any wires shall be strung on poles along any highway and public conduits shall afterwards be laid therein, said Commission may require the wires so strung upon poles to be taken down and put in the Public conduit; and upon any refusal to do so may remove the same. Said Commission may prescribe the terms and conditions upon which the public conduits shall be used for such purpose."

Section 10 of the same Chapter is as follows:

"Any rights acquired under any such permit shall cease whenever the Common Council shall so direct and all poles and wires shall thereupon be removed at the expense of the person or corporation erecting or controlling the same."

Sec. 11 of the same Chapter provides as follows:

"When any wires erected under any such permit shall interfere with any wires of the Public Lighting Commission, or with any Telephone or Telegraph wires of the Fire Commission or of the Police Department, the Public Lighting Commission may direct the removal of the same or such alterations in relation thereto as will obviate or prevent such interference."

RENTAL RATES.—Conduits may be rented in accordance with the above sections at an annual rate per duct to be fixed by the Public Lighting Commission, and which in no case shall be less than the annual cost to the city, including maintenance costs, interest on the investment and depreciation, the lessee to pay for all duct made unavailable by his occupancy of a part until such time during the term of the lease it may become available.

RENT PAID.—Rent of conduits shall be paid semi-yearly in advance.

REPAIRS.—Repairs or alterations to conductors shall not be made without a permit. Applications for permits shall be made in writing and shall state the nature of the repairs and the manholes to which access is desired.

CABLE MARKERS.—In every manhole cables shall be plainly marked, showing the name of the owner and the potentiality of the current carried.

ENTRANCE TO MANHOLES.—Entrance to manholes without the proper permit will be treated as a violation of an ordinance to protect the Public Lighting System, approved September 17th, 1895.

MANHOLE GUARDS.—When a manhole is entered a frame 30 inches high shall be placed around the opening and on which a red flag at least a foot square shall be displayed. A watchman shall also be placed to guard against accidents.

SMOKING AND USE OF LIQUOR.—Smoking or the use of liquor in or around manholes will not be permitted.

GAS IN MANHOLES.—Work shall not be commenced in a manhole until it is found absolutely free from gas.

INSULATION.—All conductors carrying to exceed 100 volts, shall at a temperature of 75 degrees Fahr., have when pulled

in and jointed an initial insulation resistance of not less than 10 megohms per mile for every 100 volts working pressure. When such resistance shall be found less than three megohms per 100 volts on cables carrying more than three hundred volts and one megohm per 100 volts on cable carrying less than three hundred volts per mile the use of such conductor shall cease. All cables carrying above three hundred volts shall be covered with continuous lead sheath and the covering effectively grounded.

LIABILITY OF THE CITY OF DETROIT. — The said lessee shall save and protect the City of Detroit from any and all liability or costs which may arise through injury or damage to property belonging to or to persons employed by said lessee and in connection with the public ducts.

TERMINATION OF LEASES. — Leases may be terminated by either party by the serving on the other of a six months written notice, otherwise the lease shall continue and remain in force until so terminated.

CONDENSED CASH STATEMENT.

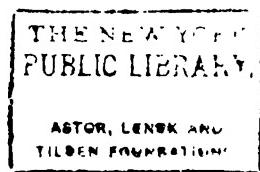
For 12 Months to June 30, 1897.

RECEIPTS.

To Balance in hands City Treasurer, July 1, 1896...	\$ 5,177.06
" Balance of Taxes, 1893-4-5. July 1, 1896	16,035.00
" Received from Taxes prior to 1893 Assessment.	253.29
" Additional tax account, 1895.....	2.02
" Amount of taxes appropriated, 1896.....	150,000.00
" Amount of bonds issued, 1896.....	50,000.00
" Received from Inspection department	2,060.00
" " " sale of labor and supplies	824.62
" " " work rendered other departm'ts	1,411.11
" " " rentals of conduits and poles....	550.22
" " " lighting other departments....	1,752.09
" " " accounts payable	<u>16,745.27</u>
Total Receipts.....	\$ 244,810.68



CRANE LIGHT.



DISBURSEMENTS.

By one year's operating expenses	\$110,141.38
" Investment disbursements.....	89,091.88
" Expenses Inspection department.....	2,292.88
" Cost of labor and supplies for other departm'ts .	948.09
" Increase in stores	5,683.60
" Increase in accounts receivable.....	<u>651.48</u>
Total Disbursements	\$ 208,809.40
Excess of Receipts.....	\$ 36,001.28

BALANCES, June 30, 1897.

In City Treasurer's hands.....	\$ 17,186.01
In Secretary's hands.....	333.96
Balances of taxes, 1893	460.40
" " 1894	1,610.32
" " 1895	2,700.67
" " 1896	9,332.20
Worthless taxes, personal, 1893	1,227.77
" " " 1894	1,264.53
" " vessel, 1894	178.49
" " " 1895	157.11
" " personal, 1895	1,542.15
" error tax collector, 1895	7.67
Total Balances.....	\$ 36,001.28

CONDENSED CASH STATEMENT.

April 4, 1893 to June 30, 1897.

RECEIPTS.**From the City of Detroit:**

Tax of 1893	\$175,000.00
Balance of Lighting Fund of 1893.....	3,226.19
Bond Issue, 1893	600,000.00
From the Contingent Fund, 1893.....	25,000.00
Tax Levy of 1894	174,362.44
" 1895	158,276.25
" 1895 addition to	2.02
" 1896	150,000.00
Bond Issue of 1896	50,000.00
Taxes prior to 1893	<u>4,217.17</u>
Total from the City of Detroit.....	<u>\$ 1,340,084.17</u>

From other Sources:

From Inspection Department.....	2,060.00
" Work and Material supplied other City Departments	1,411.11
" Sale of old Material	3,538.49
" Rent of Conduits and Poles.....	1,012.68
" Lighting other City Departments ...	11,513.61
" Accounts Payable	<u>16,745.27</u>
Total from other Sources	<u>\$ 36,281.16</u>
Total Receipts	<u>\$ 1,376,365.33</u>

DISBURSEMENTS.**Investment Accounts:**

Conduits	\$ 72,870.69
Cables	31,182.19
Belle Isle Plant	7,821.85
Buildings and Wharf.....	109,098.61

Investment Accounts—continued.

Real Estate	63,125.00
Shop, Machinery, Tools, etc.....	,691.31
Lines	121,296.14
Towers and Posts	95,755.02
Steam Plant	101,789.24
Electric Plant, Arc.....	52,480.81
Electric Plant, Incandescent	11,220.80
Railway Track.....	9,935.60
Arc Lamps	46,955.47
 Total Investment.....	\$ 729,222.73

Operating Accounts:

Operating, or City Lighting Expense, from April 4,
1893, to June 30, 1896.

Office Expense.....	\$ 17,853.51
Advertising	319.16
Public Light from Private Companies	381,459.72
Fuel	17,162.20
Carbons	8,741.79
Pay Rolls	56,178.13
Printing and Stationery.....	403.12
General Supplies.....	4,366.37
Oils and Rags.....	1,637.85
Teaming	2,192.60
Incandescent Lamps	432.42
Globes and Nets	676.93
 Operating Expense, 12 months to June 30, 1897.....	\$ 491,423.80
Inspection Department Expense	110,141.38
Cost of Labor and Stores for other City Departments..	2,292.88
Increase in Stores.....	948.09
Accounts Receivable.....	5,683.69
 Total Disbursements.....	\$ 1,340,364.05
Total Receipts.....	\$1,376,365.33
Total Disbursements.....	1,340,364.05
 Excess of Receipts	\$ 36,001.28

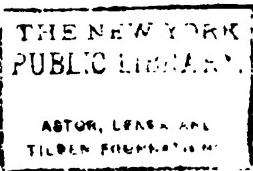
Balances June 30, 1897:

In City Treasurer's hands	\$ 17,186.01
In Secretary's bands	333.96
Taxes of 1893.....	460.40
" 1894.....	1,611.32
" 1895.....	2,700.67
" 1896.....	9,332.20
Worthless personal taxes, 1893.....	1,227.77
" " " 1894.....	1,264.53
" vessel " 1894.....	178.49
" " " 1895.....	157.11
" personal " 1895.....	1,542.15
Error Tax Collector, " 1894.....	7.67

	\$ 36,001.28



CENTER SUSPENSION LIGHT.



BALANCE SHEET.

June 30, 1897.

City of Detroit, Taxes of 1893....	\$ 460.40
" " " 1894....	1,610.32
" " " 1895....	2,700.67
" " " 1896....	9,332.20
Treasurer, City of Detroit.....	17,186.01
Petty Cash Balance	333.96
Commercial National Bank.....	651.48
W. F. Conant.....	110.27
Appropriation Balance, July 1, '96	217,090.15
Lighting Municipal Buildings....	1,752.00
Old Material.....	824.12
Rentals.....	550.22
Inspection Department, Expenses	2,292.88
" " Receipts.	2,060.00
Foreign Work, Expenses.....	948.09
" " Receipts.....	1,411.11

Maintenance Accounts:

Buildings, track, dock, etc.....	810.71
Steam Plant.....	2,544.64
Electric Plant	1,461.29
Mis. Tools and Machinery.....	546.63
Conduits	1,354.96
Towers and Lamp Posts.....	4,056.26
Arc Lamps.....	3,824.34
Lines.....	6,982.23
	21,581.06

Executive Accounts:

Salary Sec'y and City Elec.....	3,700.00
Printing and Stationery	962.08
Store Room	1,219.71
Clerks and Office Expense	2,339.96
Civil Eng. and Draughting.....	1,731.54
	9,953.29

CONSTRUCTION DISBURSEMENTS.

For 12 months ending with June 30, 1897.

Conduits	\$ 12,652.01
Belle Isle Plant.....	7,597.85
Buildings, Track, Dock, etc.....	1,217.30
Miscellaneous Tools and Machinery	93.22
Lines	9,501.43
Towers and Lamp Posts.....	1,224.39
Steam Plant.....	17,803.03
Electric Plant, Arc.....	19,687.25
Electric Plant, Incandescent.....	1,705.55
Machine Shop.....	34.00
Arc Lamps.....	17,575.85
Total	\$ 89,091.88

ASSETS AND LIABILITIES.

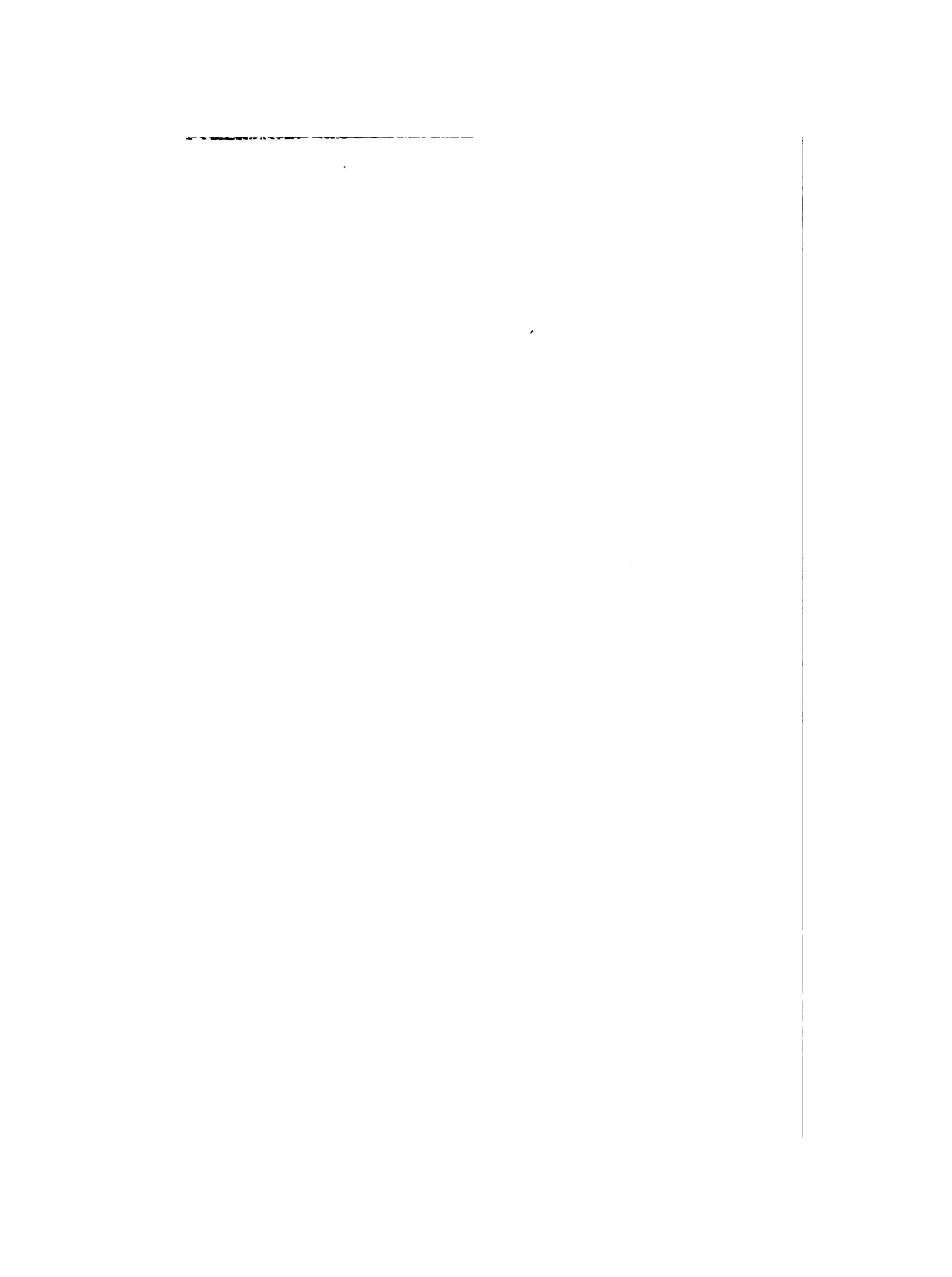
June 30, 1897.

ASSETS.

Stores	\$ 5,683.69
Accounts Receivable.....	651.48
In City Treasurer's hands	17,186.01
In Secretary's hands	333.96
Uncollected Taxes, 1893.....	460.40
" " 1894.....	1,610.32
" " 1895.....	2,700.67
" " 1896.....	9,332.20
Total Assets.....	\$ 37,958.73

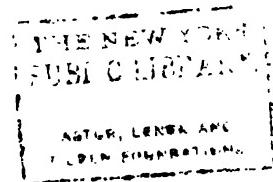
LIABILITIES.

Accounts Payable	<u>16,745.27</u>
Excess of Assets.....	\$ 21,213.46





POST LIGHT.



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ANNUAL REPORT

OF THE

Public Lighting

Commission

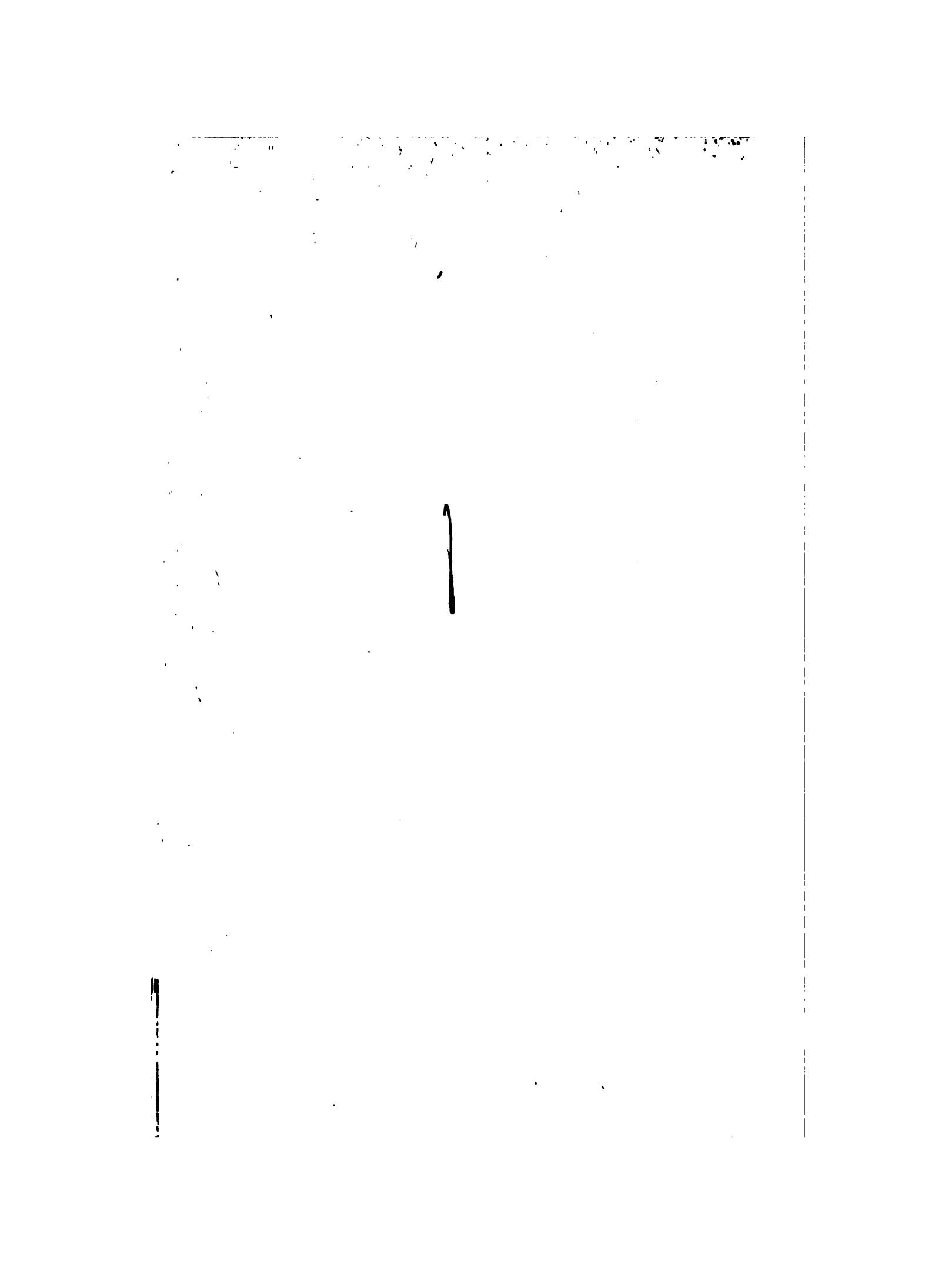
OF THE

CITY of DETROIT

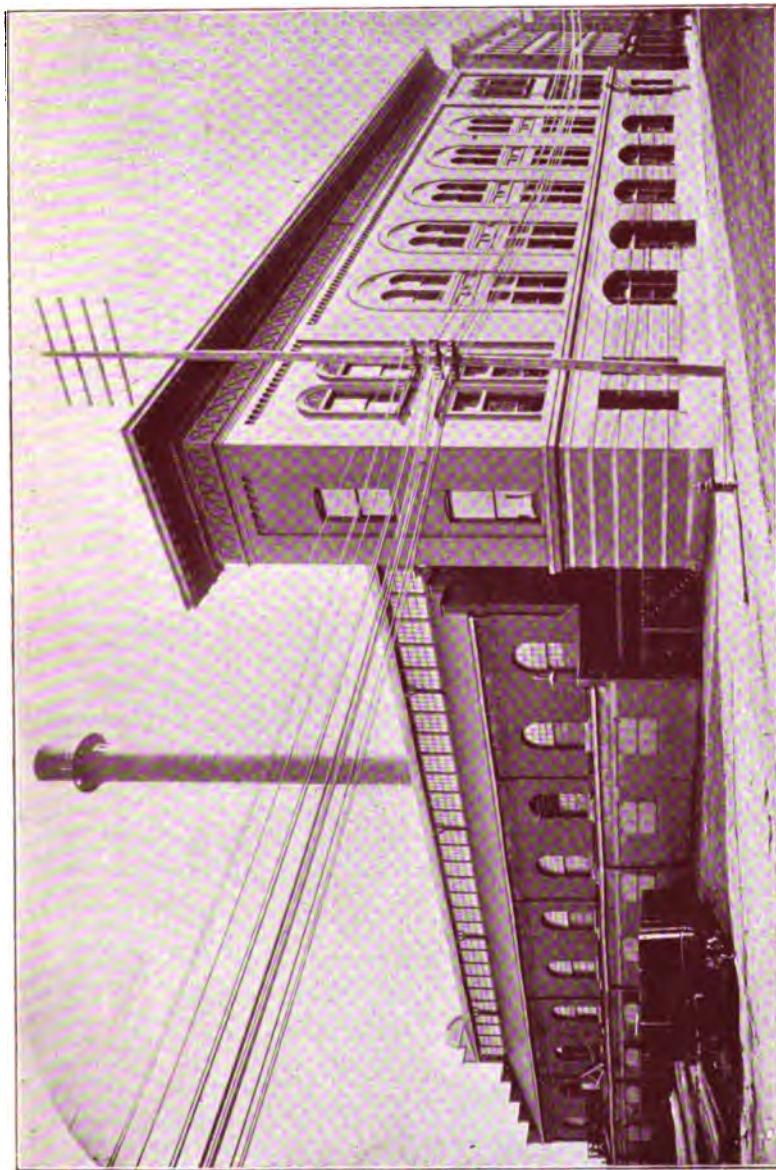
MICHIGAN

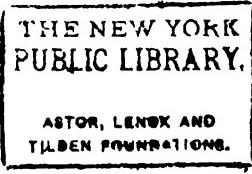
FISCAL YEAR ENDING JUNE 30TH. 1898.

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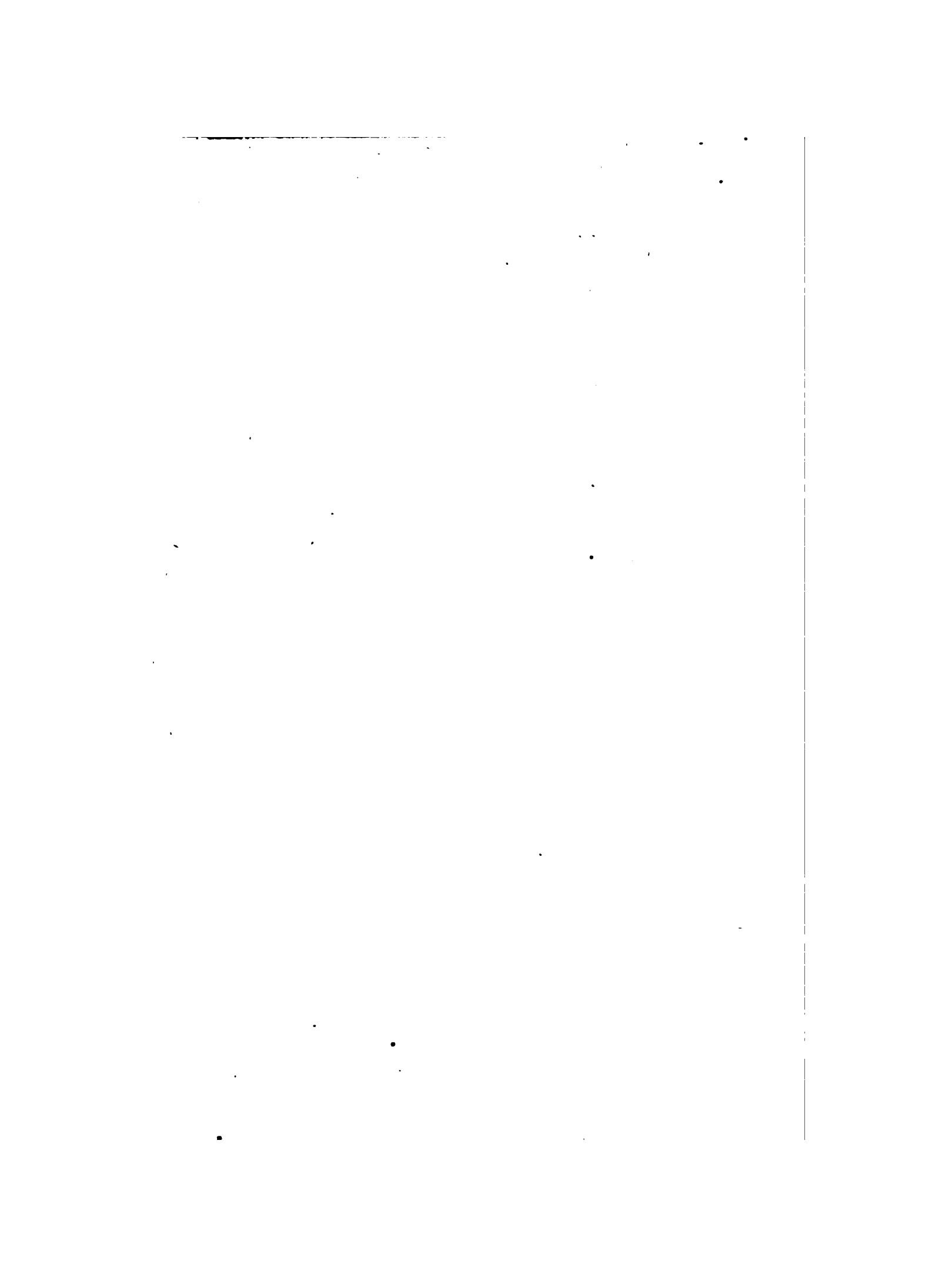
OFFICE AND STATION BUILDINGS.





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...THIRD...

ANNUAL REPORT

OF THE

Public Lighting Commission

Fiscal Year ending June 30, 1898.

THE COMMISSION.

RICHARD H. FYFE, President.....	Term expires April 4, 1901
JOHN MINER, Vice-President.....	Term expires April 4, 1902
JOHN ATKINSON.....	Term expires April 4, 1899
CHAS. H. RITTER.....	Term expires April 4, 1900
WM. A. LIVINGSTONE.....	Term expires April 4, 1903
FREDK. F. INGRAM.....	Term expires April 4, 1904

FORD STARRINGSecretary.

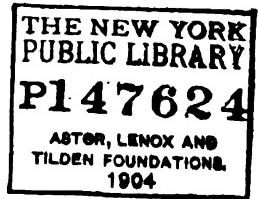
W. D. STEELE....City Electrician and General Superintendent.

JOHN DONALDSONChief Engineer.

A. C. MARSHALL.....Outside Superintendent.

Custodian of Funds.....W. B. THOMPSON, City Treasurer.

Auditor of Accounts.....F. A. BLADES, City Controller.



The Ex-Members of the Commission are:

C. A. Newcomb, April, 1893, to July, 1893.
Martin Butzel, April ,1893, to April, 1894.
George H. Lothrop, April, 1893, to April, 1896.
W. A. Jackson, April, 1893, to July, 1896.
Edwin Henderson, April, 1896, to December, 1896.
W. R. Farrand, April, 1893, to April, 1897.
J. L. Hudson, April, 1893, to May, 1898.



Detroit, July 12th, 1898.

To The Honorable The Common Council,
City of Detroit, Michigan.

Gentlemen:—

The Public Lighting Commission respectfully submits for your consideration the accompanying report of the business intrusted to their care during the fiscal year ending June 30, 1898. In the report an effort has been made to present such data as will best convey an understanding as to the work done, the costs of Municipal Lighting and as to the condition of the city's investment.

We have the honor to be the

PUBLIC LIGHTING COMMISSION,

By R. H. FYFE, President,

FORD STARRING, Secretary.

Office of Public Lighting Commission.

DETROIT, July 12, 1898.

The fiscal year just closed is the first in which a municipal lighting plant of any size has had as near a thorough test as possible, and the results are awaited by those interested for and against an institution of its kind. The physical results, that is, the conversion of fuel and water into electric current, for the year will bear comparison with the results of any plant, commercial or otherwise, generating electricity. The results from labor will not compare as favorably for the reason that slightly higher wages are paid and much shorter hours of work obligatory.

The Commission considered that the plant, operated under its enforced conditions, should produce an arc light of 2,000 candle power for the year at about \$50.00, and the heads of departments were instructed accordingly. The first step was the reorganization of the force of employes. The heads of departments and clerks were put on the salary list and made subject to call for work at any time, day or night, without extra compensation for work in excess of eight hours per day. The operating crews were assigned work in three divisions of the day; i. e., from 8 a. m. to 4 p. m., from 4 p. m. to 12 m, and from 12 m. to 8 a. m. The repair crews and clerks were assigned to duty from 8 a. m. to 5 p. m., with a noon hour for dinner. Employes in the operating crews having similar duties were allowed to exchange shifts between themselves. The arbitrary shifting of crews was abolished and the former relief crews done away with. This resulted in a marked saving in labor and in station maintenance supplies. The item of trimming was a very heavy one and the routes for trimmers were rearranged, increasing the work from an average of 59 lamps to 74 lamps and $7\frac{1}{2}$ miles average length of routes. The work of each trimmer, however, was calculated to be done in about seven hours, the trimmer walking his circuit, and no work to be required of the trimmer after completing his circuit.

By these economies the Commission was able to reduce the cash outlay per lamp from \$64.19 per annum for a monthly average of 1,564 lamps for the preceding year, to \$51.85 per annum for a monthly average of 1,744 lamps. The reduction was largely in the item of labor, being reduced from \$43.57 per lamp to \$33.27 per lamp, while the reductions in the cost of supplies was from \$20.62 to \$18.58 per lamp.

To arrive at the cost of an arc lamp to the City of Detroit per annum, there should be added to the above cash cost of \$51.85 a certain amount for interest on the investment, for loss of taxes through the plant not being owned by private parties and for depreciation. The first two items are easily computed, for the average investment for the year was, in round numbers, \$750,000.00 with interest at 4 per cent, and the assessed value of the same

was placed by the City Assessors at \$400,000.00, with the rate of taxation at \$17.68 for the City and at \$3.24 for the State and County, a total tax of \$20.92 per \$1,000; but with the latter, that is, the figuring of the depreciation, there is a wide difference of opinions. As per the statistics published by the London Electrician, of England, it is customary for the municipal lighting plants of that country to set aside annually about three per cent of the entire investment as part of the expenses for a sinking fund. The writers on the subject in scientific journals in the United States have ranged from 3 per cent to $7\frac{1}{2}$ per cent as the amount to be charged off for depreciation or for a sinking fund. This Commission held in its preceding report that a plant established and maintained similar to the Detroit City Plant should not be subjected to a heavy expense item for depreciation or a sinking fund. The Commission held that only a "wear" depreciation should be charged, and then only on such parts (as boilers) which, after a period of time, would have to be changed as an entirety. As a compromise, however, the Commission takes the rate of 3 per cent to set aside with the cost of a lamp per year for a sinking fund or depreciation, and the reader may change that rate as per his pleasure. Computing these fixed charges we have:

Interest at 4 per cent on \$750,000 average investment.....	\$30,000.00
Depreciation at 3 per cent on \$750,000 average investment.....	22,500.00
Taxes at \$20.92 on \$400,000 assessed valuation.....	8,368.00
A total of	\$60,868.00

Proportioning this on the basis of the electrical output and we have \$55,207.27 chargeable to arc lighting, or \$31.65 per annum per arc lamp. The total cost of an arc lamp to the City of Detroit per annum on these figures may, therefore, be placed at \$83.50.

In February, 1893, the Detroit Electric Light & Power Co. offered to light the City of Detroit for a period of ten years at the rate of \$102.20 per arc lamp per year. While there are no recent bids available from which the exact cost to the City of an arc lamp by commercial companies may be obtained, it is entirely reasonable to presume that in common with all other industries, the cost per lamp has been reduced at least 10 per cent during the interval of five years which has elapsed. The cost, therefore, at present may be assumed to be not greater than \$90.00 per arc lamp per year. For a number of reasons it is believed that the rate of \$90.00 per year is a conservative figure which may be justified.

Taking that assumption as correct, it will be seen that the amount per arc lamp which the City has saved during the past year, after allowing the 3 per cent for depreciation, as compared with the cost of the same lamp by a commercial company, was something less than \$7.00. This narrow margin, the Commission believes, fully justifies its course in reducing the expenses during the past year to the lowest minimum possible consistent with the best service and the limiting conditions under which a municipal plant must always be operated.

While it is possible that improvements in some machinery may be made soon, which would cause a partial loss to the city of the value of part of its investment in machinery, on the other hand it is only fair to state that there is an equal probability of compensating improvements in other devices and which will enable the City to further reduce the cost per lamp per year. Reductions in cost, due to such improvements, of course would not accrue to the City if it already had a lighting contract extending over a period of years.

The ultimate success of the plan of municipal ownership of a public lighting plant, viewed from the standpoint of economy to the taxpayer, can not as yet be claimed to be assured in the City of Detroit. Time is an essential element of consideration in arriving at a judgment at all valuable upon this question. The plant, the business of which we have the honor to administer, has been in existence since April, 1895, but it is only since November 1st, 1897, that the construction feature of our business was completed and the plant placed upon a purely operating basis. This period is entirely too short to justify absolute conclusions as to the ultimate success of the municipal venture from an economical view.

The margin of profit per lamp at the present time, while it is not large, nevertheless is a showing to the advantage of the City, which it is to be hoped will be maintained or increased in the future. It is but just to observe in this connection that the quality of light furnished has been uniformly of the full standard of 2,000 candle power, which is better than was found practicable to obtain of contractors; and also that collateral advantages not easily reducible to terms of pecuniary value have accrued to the City by reason of its operation of its own lighting plant. The results, such as they are, have been secured by the Commission only by the practice of the strictest economy and the rigid exclusion of all of those elements so apt to intrude into the administration of public municipal affairs, and which operate only to confound business principles and political expediency in perplexing entanglement. It has not been at all times easy to persuade some that these two policies occasionally clash irreconcilably, and, in the determination of the one or the other to be followed, it was the duty of the Commission to be guided solely by the interest of the taxpayer.

It has been the constant aim of the Commission, since its organization, to effectuate the purpose and to demonstrate, if possible, the wisdom of the judgment of our citizens in authorizing the large investment in the present lighting plant and substituting the system of municipal ownership instead of the contract system of public lighting. Our predecessors on this Board were actuated by the same purpose and we, as well as the citizens at large, are indebted to them, and each of them, for the public spirit and business sagacity they displayed in installing the plant and inaugurating the policy of administration under which we have continued to operate.

The operations of the Detroit Municipal Lighting Plant have been conducted so far under the most favorable conditions for its success. It is not difficult, however, to foresee that if the policy which has, up to the present, guided the Board in its administration shall be abandoned or less rigidly adhered to, the narrow margin of advantage to the City which now appears, and which has been earned only under most favorable conditions, would entirely disappear and the public lighting plant become for the citizens an expensive and troublesome burden.

THE CITY'S LIGHTING PLANT.

The City's Lighting Plant now consists of the following:

LAMPS.

1,725 double carbon Brush lamps.
117 single carbon Adams-Bagnall lamps.

BOILER HOUSE.

Seven Double Deck Tubular Boilers, C. C. Peck design; each boiler has 3,000 square feet of heating surface and is equipped with the Hawley Down Draft Furnace and Hoppes Live Steam Purifier and Worthington Water Meter. The coal is handled in one ton charging cars on a Hunt Industrial Railway. Coal bins of 800 tons capacity adjoin the firing floor.

PUMP ROOM.

One Fire Pump of 1,000 gallons per minute capacity. This pump is connected to a complete system of fire mains and is always under steam. It is used during the day time to feed the boilers and to operate a water motor which runs the machine shop.

One Worthington Pressure Pattern Feed Pump, in reserve, of 100 gallons per minute capacity. This is connected to a duplicate boiler feed system.

Two Worthington Jet Condensers, with feed pumps attached. Either condenser will condense 36,000 pounds of steam per hour, and the auxiliary feed pump can feed the same amount of water to the boiler. All of the water used in the operation of the plant is pumped by the above machinery from the Detroit River.

One Berryman heater, which utilizes the exhaust steam from the pumps and small engines in heating the boiler feed water.

One Westinghouse Air Compressor, which supplies the compressed air for cleaning machinery.

ENGINE ROOM.

ARC LIGHTING PLANT:

Five triple expansion, marine type engines; 200 revolutions per minute, 160 pounds steam pressure; 25-inch vacuum; cylinders 11 $\frac{1}{4}$ inch, 18 inches and 29 inches in diameter, and 18 inch stroke; horse power at maximum efficiency, 340.

Twenty 50-Kilowatt; four pole, Western Electric arc dynamos for constant current at 9.6 amperes; speed 500 revolutions per minute. Four dynamos are driven by each engine, the connection being 7, $\frac{1}{8}$ inch cotton ropes to each dynamo.

Two 57 $\frac{1}{2}$ Kilowatt; two pole, Western Electric arc dynamos for constant current at 9.6 amperes; speed 465 revolutions per minute. Each direct connected to triple expansion Willan's center-valve engines.

INCANDESCENT LIGHTING PLANT:

Three compound Westinghouse engines, run non-condensing; cylinders 9-inch and 15-inch, with 9-inch stroke; speed, 350 revolutions per minute.

Three 55-Kilowatt, 2-phase, Westinghouse alternators, belt driven. Alternators are run in parallel; 1,100 volts primary, 110 volts secondary.

Two excitors; one belt driven and one direct-connected to a Westinghouse standard engine.

LINES AND POLES.

The overhead lines of the plant are strung on a total of 6,307 poles, owned as follows:

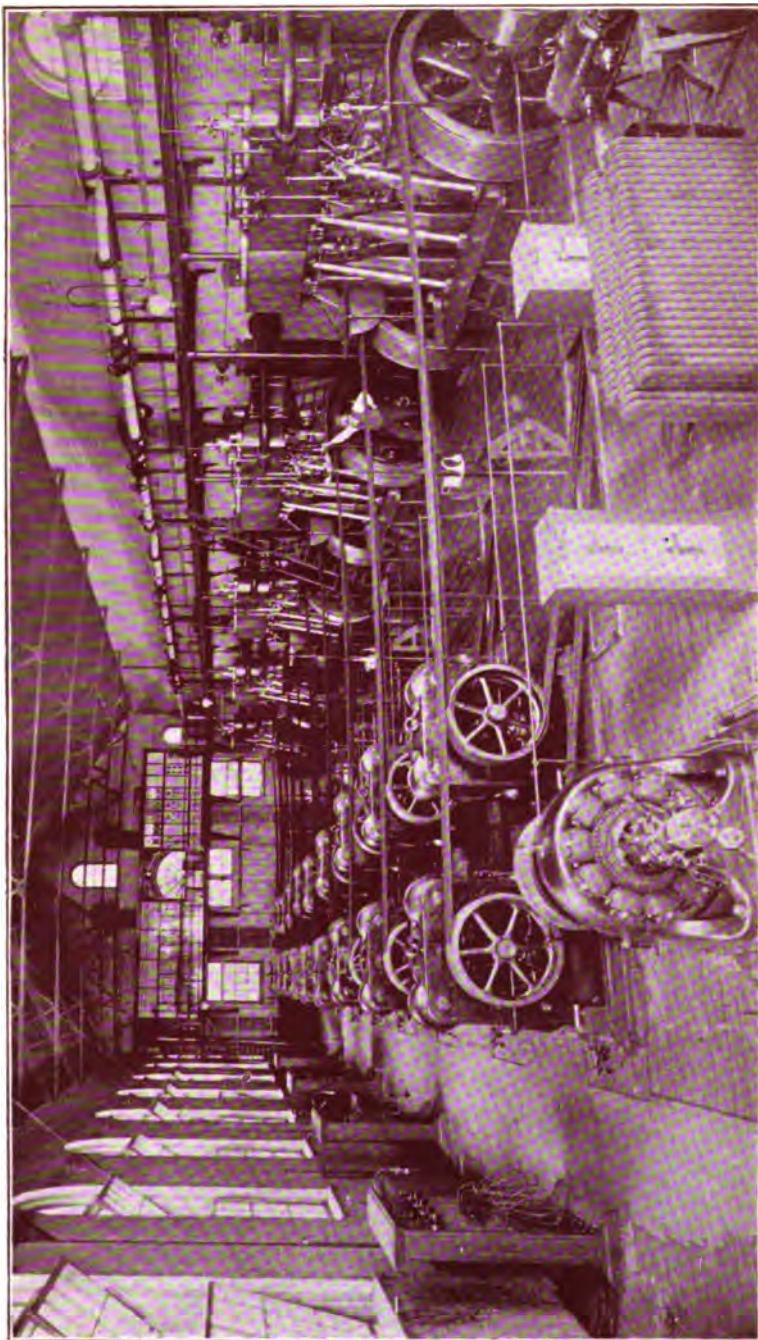
Public Lighting Commission.....	5,210
Fire Commission	522
Police Commission	401
Peninsular Electric Lighting Co.....	62
Michigan Telephone Co.....	57
Detroit Street Railways	35
Edison Illuminating Co.....	5
Detroit Telephone Co.....	15
 Total	 6,307

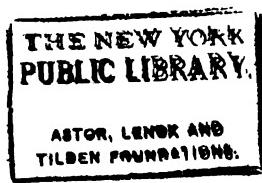
The poles of the Public Lighting Commission are used by other parties as follows:

Fire Commission	671	poles, 1,260	contacts.
Police Commission	828	" 2,209	"
Edison Illuminating Co.....	133	" 495	"
Det. Electric Light and Power Co....	171	" 338	"
Peninsular Electric Lighting Co.....	357	" 1,079	"
East Side Electric Co.....	65	" 132	"
Detroit Street Railways.....	266	" for feeders.	
Detroit Street Railways.....	262	" for span wires.	
Detroit Telephone Co.....	262	"	
Harris Burglar and Fire Patrol.....	250	" 253	contacts.
Strubel Bros.....	9	" 18	"
Parke, Davis & Co.....	1	" 2	"

The Public Lighting Commission has strung on poles a total of 394 miles of wire.

GENERATOR ROOM.





THE UNDERGROUND SERVICE.

Within the half-mile circle all the wires of the city are underground. The conduits vary in size from 4 ducts to 24 ducts, according to the possible demands upon them. The ducts are a special 3-inch vitrified tile laid in concrete.

The amount of conduits is as follows:

SIZE OF LINE.	LENGTH OF LINE.	FT. OF SINGLE DUCT.
4 ducts.	2,222 ft. 5 in.	8,889 ft. 8 in.
6 "	1,737 " 8 "	10,426 "
9 "	21,203 " 10 "	190,834 " 6 "
10 "	138 " 1 "	1,380 " 10 "
12 "	95 "	1,140 "
15 "	560 " 10 "	8,412 " 6 "
16 "	2,104 " 8 "	33,674 " 8 "
24 "	347 " 2 "	8,332 "
Manholes.	761 " 8 "	.....
Total.....	29,171 ft. 4 in.	263,090 ft. 2 in.

Of lateral conduits constructed of $\frac{21}{4}$ -inch lap welded iron pipe there are 39,476.10 feet.

The following lead covered, rubber insulated cables are used in connection with the conduit system:

No. 4 B. & S., in arc light circuits.....	113,221 ft.
No. 4 B. & S., in incandescent feeders.....	36,576 "
No. 8 B. & S., in incandescent light mains.....	26,238 "

BELLE ISLE PARK.

All wires for electric lighting are placed underground, 50,000 feet of 3-inch wood conduit having been laid for this purpose, one-half of which is still unused. The more important points on the main roadways are lighted by arc lamps supported on ornamental iron posts. Twenty-nine arc lamps are used and they are operated as a part of the regular city circuits. Twenty-five thousand feet of No. 4 B. & S. gauge, lead covered, rubber insulated cable is required for this service.

The buildings in the west end of the Park are lighted by incandescent lights, the current for which is obtained from mains connected with a central transformer station, where a pair of transformers receive three-phase alternating current at 3,500 volts and deliver two-phase alternating current at 116 volts. The crossing of the Detroit River with the three-phase feeder is accomplished by the use of 8,500 feet of No. 6 B. & S. 3-conductor, lead covered and rubber insulated cable, a part of which is armored with iron wire and placed under the river. The secondary mains connecting the several buildings with the transformer house are made up of 5,800 feet of 2/o 2-conductor rubber insulated and lead covered cable and 3,000 feet of No. 4 single conductor cable.

COST OF THE CITY LIGHTING PLANT.

The City's investment proportioned between the incandescent and arc lighting on the basis of the electrical output is as follows:

	Arc.	Incandescent.	Total.
*Conduits	\$76,144.22	\$7,853.82	\$83,998.04
Cables	32,564.17	3,358.80	35,922.97
Real estate	57,222.81	5,902.19	63,125.00
Buildings, wharf, etc.....	99,665.68	10,279.92	109,945.60
Lines and poles.....	117,934.65	12,164.25	130,098.90
Towers and lamp posts.....	97,034.15	.....	97,034.15
Arc plant	58,483.65	.....	58,483.65
Incandescent plant .....	.....	13,404.03	13,404.03
Steam plant	98,119.20	10,120.41	108,239.61
Railway track and scales.....	9,955.43	1,026.88	10,982.31
Machine shop	7,131.17	735.54	7,866.71
Arc lamps and switches.....	52,196.76	.....	52,196.76
 Total	\$706,451.89	\$64,845.84	\$771,297.73
Bell Isle plant .....	.....	.....	18,848.00
 Total .....	.....	.....	\$790,145.73

*About one-quarter of these are occupied.

COSTS REDUCED TO A LAMP BASIS.

Reducing the above investment, exclusive of the Belle Isle, to the amount per lamp on the basis of the electrical capacity of the plant, viz: 2,250 arc of 2,000 candle power, and 3,500 incandescent of 16 candle power, and we have the following:

	Arc.	Incandescent.
Conduits occupied	\$8.46	\$2.25
Cables	14.45	0.96
Real estate	25.43	1.69
Buildings, wharf, etc.....	44.29	2.94
Lines and poles	52.41	3.46
Towers and lamp posts.....	43.13	....
Arc plant	25.99	....
Incandescent plant .....	....	3.83
Steam plant	43.62	2.89
Railway track and scales.....	4.42	0.29
Machine shop	3.17	0.21
1843 Arc lamps and switches.....	28.32	
	—	—
	\$293.69	\$18.52

ARRANGEMENT OF LAMPS.

The 1,820 arc lamps now operated are distributed in 1,441 locations. The lights are placed on towers, posts or center suspension, as the conditions demand. They are as follows:

913 cranes,	913 lamps.
159 center suspensions,	159 "
122 posts, single lamps,	122 "
5 posts, double lamps,	10 "
85 mast arms,	85 "
2 pole tops,	2 "
17 indoor work,	17 "
44 three-light towers,	132 "
92 four-light towers,	368 "
2 six-light towers,	12 "
<hr/>	
1,441 locations,	1,820 "

HOURS OF LIGHTING.

Month	Total Hrs. Operated.	Av'ge Hrs. Operated..
July	235:40	7:36
August	266:20	8:36
September	301:10	10:02
October	361:00	11:37
November	388:05	12:58
December	420:45	12:58
January	406:20	13:08
February	340:15	12:09
March	333:15	10:45
April	276:45	9:14
May	244:10	7:52
June	212:35	7:05
<hr/>		
	3,786:20	10:23.

DISTRIBUTION OF LAMPS BY WARDS.

The lamps distributed by Wards, with comparative size and assessed value of the Wards of the City, are as follows:

Ward.	Acreage.	Total assessed value, 1898.	Lamps.
I.....	1,072.39	\$37,208,480	177
3.....	736.23	7,918,770	93
5.....	636.36	7,615,650	83
7.....	666.48	6,898,180	106
9.....	875.73	8,038,610	92
11.....	646.14	6,475,970	94
13.....	1,070.61	6,385,110	93
15.....	1,151.54	6,511,390	*135
17.....	2,560.00	7,888,240	61
 Total East Side.....	 9,415.48	 \$94,940,400	 934
 2.....	 836.96	 \$55,410,080	 173
4.....	937.44	14,646,160	112
6.....	780.58	9,441,310	110
8.....	991.79	8,394,860	110
10.....	979.68	7,454,730	108
12.....	990.79	6,310,150	93
14.....	1,175.36	6,276,050	94
16.....	1,456.59	4,763,120	86
 Total West Side.....	 8,149.19	 \$112,696,460	 886
 Grand Total.....	 17,564.67	 \$207,636,860	 1,820

*Of these 39 are on Belle Isle Park.

PUBLIC BUILDINGS LIGHTED.

The Public Buildings lighted by incandescent lights and the number of 16 candle-power lamps in each are as follows:

Public Lighting Station and Offices.....	277
City Hall and County Offices.....	752
Public Library	898
Municipal Court Building.....	227
Board of Health Offices.....	40
Water Board Offices.....	78
Police Headquarters, Central Station.....	166
Police Headquarters, East Side.....	100
Woodbridge Street Police Station.....	26
Police Barns	72
Fire Department Headquarters, Engine House No. 1.....	155
Fire Department, Telegraph Station.....	80
Engine House No. 2.....	19
Engine House No. 3.....	34
Engine House No. 6.....	45
Engine House No. 8.....	48
Engine House No. 9.....	16
Hook and Ladder House No. 2.....	17
Chemical Engine House No. 2.....	14
Board of Education Offices.....	158
Washington Normal School.....	50
Everett Night School	98
Capital Square Fountain	23
Belle Isle Park—	
Casino	195
Boathouse	22
Bathhouse	100
Dock	64
Skating Pavilion	95
Bicycle Pavilion	8
Miscellaneous	24
 Total Belle Isle Park.....	 508
 Total lamps	 3,901

LAMPS AND LAMP HOURS OPERATED.

The average number of lamps operated each month, with the total lamp hours scheduled and the lamp hours out during that time, are as follows.

Twelve Months to June 30, 1898.

	Average Number Lamps.	Total of Lamp Hours Scheduled.	Total of Lamp Hours Out. Hrs. Min.
July.....	1,603	370,714	54:28
August.....	1,603	420,804	422:57
September.....	1,605	477,413	42:07
October.....	1,631	582,105	118:29
November.....	1,766	677,995	34:22
December.....	1,806	750,115	70:02
January.....	1,813	722,746	1,117:58
February.....	1,815	606,948	293:02
March.....	1,816	593,525	653:16
April.....	1,818	492,334	4,292:31
May.....	1,823	433,297	195:59
June.....	1,826	377,356	170:12
Totals	1,744	6,505,352	7,465:23

The corresponding for the 12 months ending June 30, 1897, is as follows:

Twelve Months to June 30, 1897.

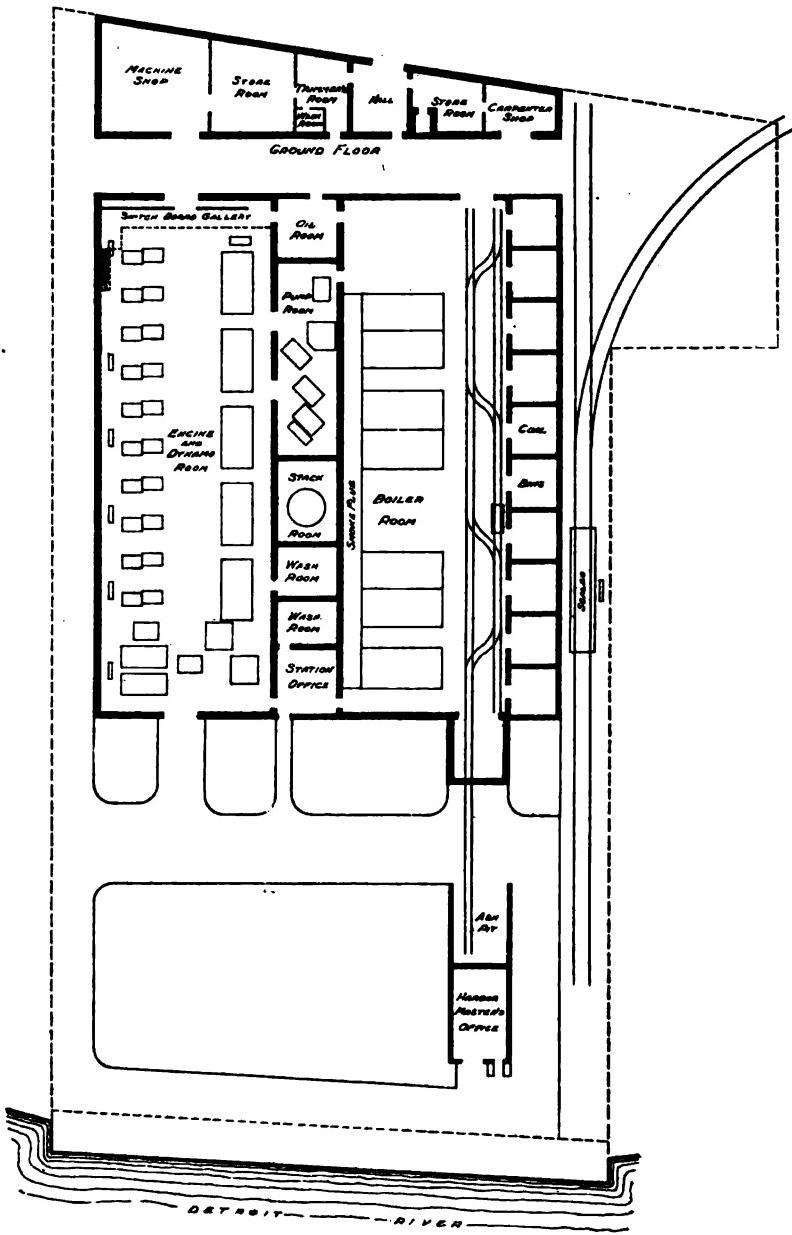
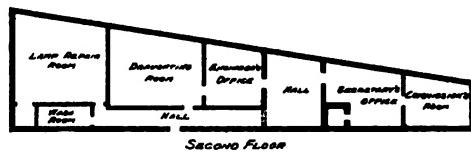
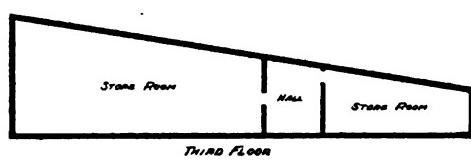
	Average Number Lamps.	Total of Lamp Hours Scheduled.	Total of Lamp Hours Out. Hrs. Min.
July.....	1,484	340,138	134:34
August.....	1,492	389,958	288:53
September.....	1,512	449,801	96:23
October.....	1,562	551,863	157:54
November.....	1,585	604,805	88:19
December.....	1,590	660,023	80:01
January.....	1,594	642,115	92:22
February.....	1,589	537,783	73:18
March.....	1,589	530,845	95:22
April.....	1,590	434,804	217:19
May.....	1,589	385,922	32:54
June.....	1,593	345,243	13:48
Total	1,564	5,873,300	1,371:07

CAUSES OF LAMP HOURS OUT.

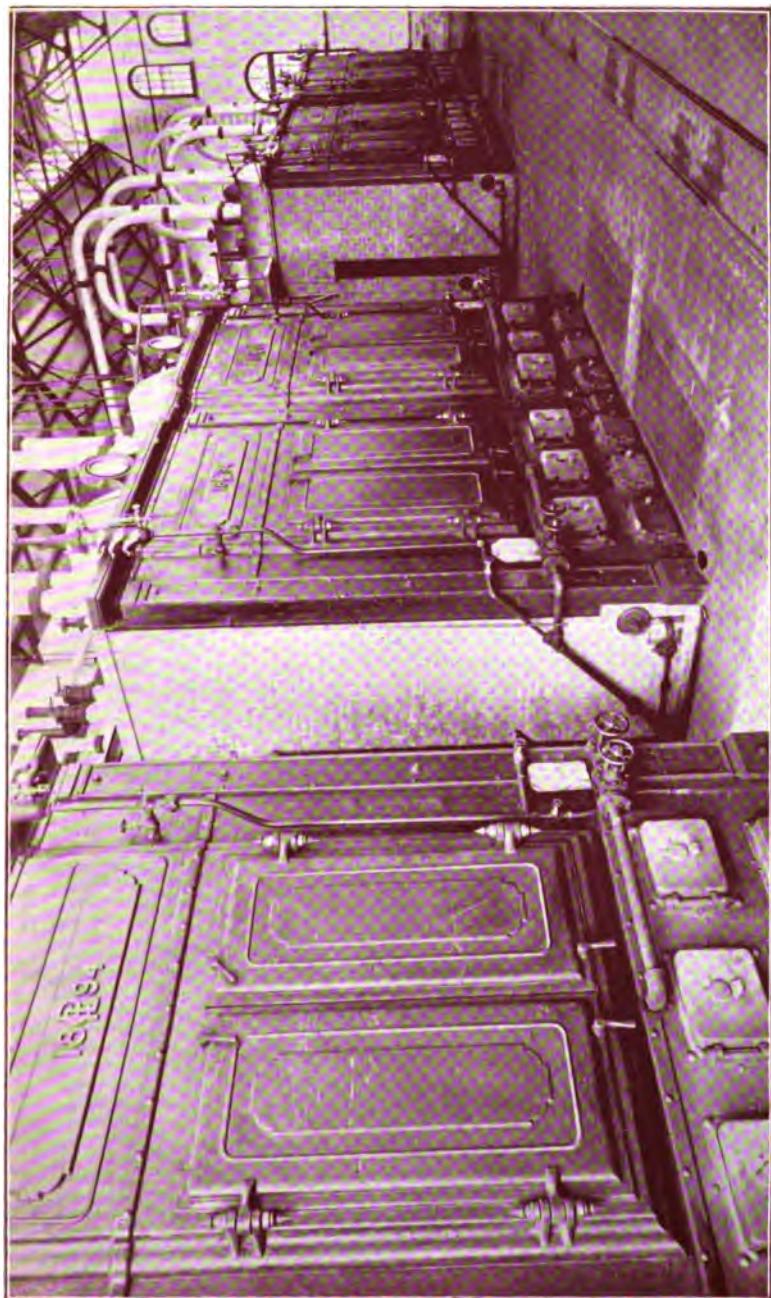
The causes of "Lamps Hours Out" for the year are summarized as follows:

Month.	Line Trouble.		Lamp Trouble.		Trimmers' Neglect.		Total.	
	Lamps.	Hrs. M.	Lamps.	Hrs. M.	Lamps.	Hrs. M.	Lamps.	Hrs. M.
July,	3	22:12	2	9:41	5	22:35	10	54:28
Aug..	199	380:08	3	16:41	5	26:08	207	422:57
Sept.,	1	5:24	..	.....	7	36:43	8	42:07
Oct.,	4	28:44	2	18:43	18	71:02	24	118:29
Nov.,	..	.....	2	11:33	10	22:49	12	34:22
Dec.,	..	.....	5	45:03	4	24:59	9	70:02
Jany.,	198	576:42	40	271:15	49	270:01	287	1,117:58
Feby.,	2	19:40	22	119:07	29	154:15	53	293:02
Mar.,	184	440:02	16	90:27	18	122:37	218	653:16
Apl.,*	881	4,094:35	11	64:16	21	136:50	913	4,292:31
May,	1	2:05	10	63:25	30	130:29	41	195:59
June,	6	36:41	16	64:50	18	68:41	40	170:12
Total,	1,479	5,606:13	129	772:01	214	1,087:09	1,822	7,465:23
Total last year, 108	403:02	56	358:15	88	609:10	242	1,371:07	

*The trimmers were on a strike and lines were cut.



GROUND PLAN OF PUBLIC LIGHTING COMMISSION,



BOILER ROOM.

THE NEW YORK
PUBLIC LIBRARY.

ASTOR, LENOX AND
TILDEN FOUNDATIONS.

TRIMMING ARC LAMPS.

The work of trimming the lamps is intrusted to a Chief Trimmer with 24 men to do the work from April 1 to November 1, and 27 men to cover the period from November 1 to April 1 of each year.

The work as laid out for the summer months is as follows:

Number of Route.	Lamps Trimmed on				Length of Route in Miles.
	Towers.	Poles.	Cent. Susp.	Total Lamps.	
1	38	45	5	88	4 $\frac{1}{4}$
2	24	55	9	88	4 $\frac{1}{4}$
3	32	54	2	88	5
4	8	47	26	81	6
5	8	58	13	79	5 $\frac{1}{2}$
6	15	43	21	79	6 $\frac{3}{4}$
7	10	60	7	76	6 $\frac{1}{2}$
8	15	40	23	78	6 $\frac{3}{4}$
9	18	53	1	72	7
10	25	38	15	78	7
11	26	41	..	67	9 $\frac{1}{2}$
12	24	37	6	67	8
13	15	40	18	74	7 $\frac{1}{4}$
14	27	31	17	75	7 $\frac{1}{2}$
15	24	45	1	70	8
16	15	45	13	73	8 $\frac{1}{4}$
17	26	45	..	71	8 $\frac{1}{2}$
18	37	30	..	67	8 $\frac{1}{4}$
19	15	39	12	66	7 $\frac{1}{4}$
20	19	47	7	73	7 $\frac{1}{4}$
21	12	52	5	69	9 $\frac{1}{4}$
22	25	40	2	67	7 $\frac{1}{2}$
23	16	45	..	61	10 $\frac{1}{2}$
24	32	32	1	65	8 $\frac{1}{2}$
<hr/>					
Tot'l 24	506	1,062	204	1,772	177
Avg'e 1	21	44	8	74	7 $\frac{1}{8}$
Belle Isle,	8	31	..	39	4
Series incandescent arc lamp equivalent,.....				9	
Grand total arc lamps.....				1,820	

COMPARATIVE KILOWATT HOUR OUTPUT.

Twelve Months to June 30, 1898.

Month.	Arc.	Incan.	Total.
July	170,527	17,004	187,531
August	193,563	17,934	211,497
September	220,566	21,589	242,155
October	268,682	25,342	294,024
November	308,487	29,179	337,666
December	341,300	32,332	373,632
January	328,867	32,340	361,207
February	276,152	28,426	304,578
March	270,048	29,042	299,090
April	224,014	25,318	249,332
May	199,233	24,596	223,829
June	173,580	23,494	197,074
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Total	2,975,019	306,596	3,281,615
Total 12 months to June 30, 1896	2,407,232	220,653	2,627,885

Twelve Months to June 30, 1897.

Month.	Arc.	Incan.	Total.
July	162,041	17,374	179,415
August	183,811	17,776	201,587
Sept.	209,159	19,477	228,636
October	256,627	22,228	278,855
November	278,306	25,748	304,054
December	303,611	30,201	333,812
January	295,381	28,689	324,070
February	247,377	22,503	269,880
March	243,959	23,388	267,347
April	200,011	20,696	220,707
May	177,532	18,350	195,882
June	158,813	17,354	176,167
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Total	2,716,628	263,784	2,980,412

COMPARATIVE AMOUNTS OF COAL CONSUMED.

The total amount of coal consumed during the year and the same reduced to the number of pounds per kilowatt hour with comparisons is as follows:

Month.	12 Months to June 30, 1898.		To June 30, 1897.	To June 30, 1896.
	Lbs of Coal Consumed.	Lbs. per Kw. Hour.	Lbs. per Kw. Hour.	Lbs. per Kw. Hour.
July	1,036,510	5.53	5.32	6.85
August	1,135,950	5.40	5.03	6.10
September	1,142,170	4.72	5.10	5.90
October	1,474,645	5.07	4.89	4.58
November	1,664,390	4.96	4.87	4.53
December	1,780,800	4.76	4.82	4.67
January	1,959,330	5.42	4.56	4.60
February	1,558,590	5.10	4.52	4.70
March	1,576,980	5.27	5.10	4.85
April	1,331,040	5.24	5.24	5.10
May	1,279,480	5.57	5.49	5.27
June	1,135,640	5.76	5.80	5.28
Total	17,075,525	5.233	4.99	4.95
Lbs. coal consumed 12 mos. to June 30, 1896.....			13,114,531	
Lbs. coal consumed 12 mos. to June 30, 1897.....			15,032,230	
Lbs. coal consumed 12 mos. to June 30, 1898.....			17,075,525	

EMPLOYES AND COMPENSATION.

The employes of the Public Lighting Commission on June 30th, 1898, were:

Executive Department:

	Rate per year.	Rate per day and 7 days per week.	Rate per day and 6 days per week.
1 Secretary	\$1,800.00	....	....
1 City Electrician	2,000.00	....	....
1 Outside Superintendent	1,100.00	....	....
1 Bookkeeper	720.00	....	....
1 Storekeeper	480.00	....	....
1 Superintendent's clerk	480.00	....	....
1 Janitor .....	.....	....	\$1.60
1 Draughtsman	480.00	....	....

8

Inspection Department:

2 Inspectors, each	900.00	....	....
1 Permit clerk	720.00	....	....

3

Station Department:

1 Chief Engineer	1,500.00	....	....
2 First Engineers .....	.....	\$3.00	....
3 Second Engineers, each.....	.....	2.00	....
6 Firemen, each .....	.....	1.75	....
1 Coal passer .....	.....	1.75	....
1 Handy man	720.00	....	....
6 Oilers, each .....	.....	1.50	....
1 Chief Electrician	1,000.00	....	....
2 Assistant Electricians, each...	.....	2.50	....
3 Switchboard boys, each.....	.....	1.00	....
1 Helper .....	.....	....	1.50
2 Laborers .....	.....	....	1.50

29

Trimming Department:

1 Head Trimmer	900.00	....	....
24 Trimmers, each .....	.....	2.00	....
1 Patrolman, with horse.....	.....	3.00	....
1 Belle Isle man.....	900.00	....	....

27**Maintenance and Extension:**

1 Machinist .....	.....	....	2.85
1 Machinist's helper .....	.....	....	2.00
2 Carpenters, each .....	.....	....	2.00
1 Blacksmith .....	.....	....	2.50
1 Latheman .....	.....	....	2.50
1 Coppersmith .....	.....	....	2.00
1 Painter .....	.....	....	2.00
5 Laborers, each .....	.....	....	1.50
1 Cable and lamp expert.....	.....	....	3.25
1 Helper to same.....	.....	....	2.25
3 Helpers to same, each.....	.....	....	1.50
1 Dynamo and lamp repairer...	.....	....	2.25
1 Foreman of lines and towers.	.....	....	3.25
2 Regular linemen, each.....	.....	....	2.25
2 Linemen helpers (groundmen)	.....	....	2.00
1 Conduit man .....	.....	....	1.50
1 Troublemnan .....	.....	....	2.25

26

Total employees, 93.

Total pay rolls for the year, \$65,660.20.

INSIDE WIRING INSPECTION DEPARTMENT.

The work of the department having in charge the inspection of inside wiring for the year was as follows:

Month of	Number of Applications for and Permits Issued.	Number of Approvals and Certificates Issued.	Amount of Fees Collected.	Expenses.
July	199	157	\$172.75	\$247.75
August	174	203	253.50	247.75
September	279	234	228.75	235.97
October	281	249	197.00	228.30
November	249	246	264.75	238.25
December	225	278	279.25	234.20
January	211	206	206.50	228.50
February	197	217	231.25	224.00
March	252	291	294.00	221.75
April	242	229	178.75	236.00
May	218	227	240.00	231.50
June	233	243	224.50	252.00
Totals	2,760	2,780	\$2,771.00	\$2,825.97

COMPARATIVE CASH COSTS OF AN ARC LIGHT.

The year's operating expenses can be divided between the Arc and the Incandescent in proportion to the electrical output. That chargeable to Arc Lighting would be \$90,439.85, which amount reduced to the cost of an arc lamp for one year shows the following relative figures:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 6.14	\$ 2.34	\$ 8.48
Executive	3.98	.43	4.41
Station	11.44	10.44	21.88
Trimming	11.45	5.09	16.54
Shop .....	.26	.11	.37
Injuries and damages.....	...	.17	.17
 Totals	 \$33.27	 \$18.58	 \$51.85

The corresponding figures for the twelve months ending June 30, 1897, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 9.71	\$ 2.87	\$12.58
Executive	5.18	.62	5.80
Station	12.16	11.61	23.77
Trimming	13.86	5.03	18.89
Shop	2.65	.38	3.03
Injuries and damages.....	.01	.11	.12
 Totals	 \$43.57	 \$20.62	 \$64.19

COMPARISON OF OPERATING DISBURSEMENTS.

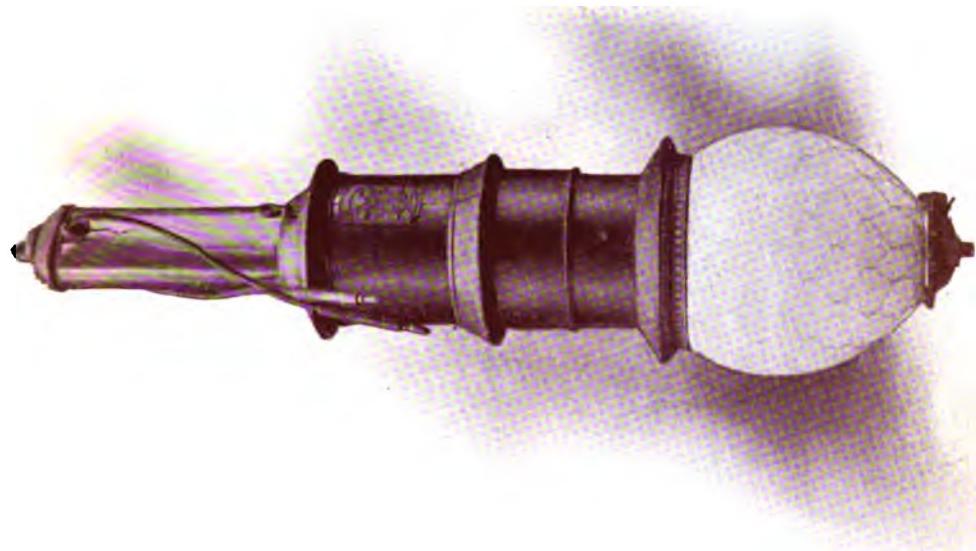
The operating disbursements for the year in the various departments, if partitioned between wages and stores, will show the following division on the basis of each \$100.00 expended:

Department.	Wages.	Stores.	Total.
Maintenance	\$11.84	\$ 4.51	\$ 16.35
Executive	7.67	.83	8.50
Station	22.07	20.14	42.21
Trimming	22.07	9.83	31.90
Shop .....	.51	.20	.71
Injuries and damages.....	....	.33	.33
 Total	 \$64.16	 \$35.84	 \$100.00

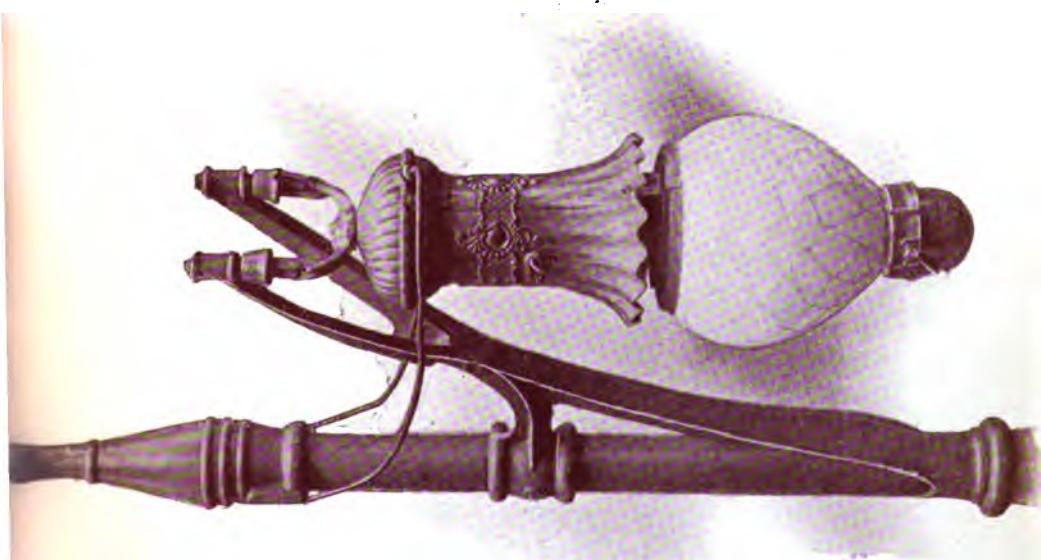
The corresponding figures for the twelve months ending June 30, 1897, are:

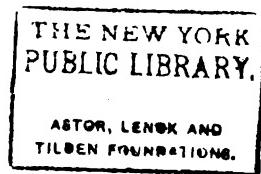
Department.	Wages.	Stores.	Total.
Maintenance	\$15.13	\$ 4.45	\$ 19.58
Executive	8.06	.96	9.02
Station	18.95	18.09	37.04
Trimming	21.61	7.83	29.44
Shop	4.13	.60	4.73
Injuries and damages.....	.01	.18	.19
 Total	 \$67.89	 \$32.11	 \$100.00

LAMPS ON TOWERS.



LAMPS ON POSTS.





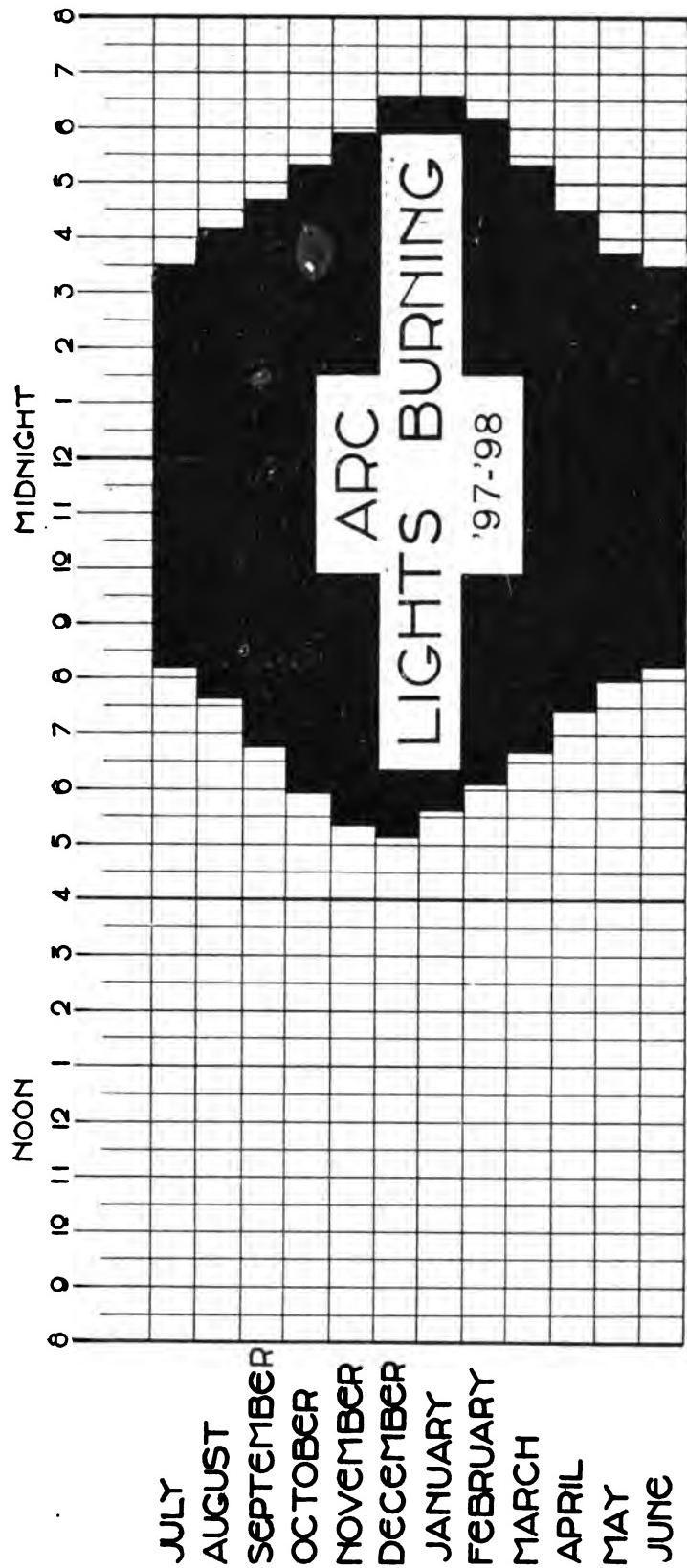


CHART IN BLACK REPRESENTING PERIOD OF ARC LIGHTS BURNING.

FINANCIAL STATEMENT.

April 4, 1893, to June 30, 1898.

Covering Existence of the Commission.

APPROPRIATIONS AND RECEIPTS.

From the City of Detroit:

Balance of Lighting Fund of 1893.....	\$ 3,226.29
From Contingent Fund, 1893.....	25,000.00
From bond issue, 1893.....	600,000.00
From bond issue, 1896.....	50,000.00
From taxes levied prior to 1893.....	4,379.89
From taxes levied 1893.....	175,000.00
From taxes levied 1894.....	174,362.44
From taxes levied 1895.....	158,278.27
From taxes levied 1896.....	150,000.00
From taxes levied 1897.....	204,780.00

Total from City of Detroit..... \$1,545,026.89

From other sources:

From Inspection Department.....	\$ 4,831.00
From work and material supplied other city de- partments	4,637.29
From sale of old material.....	4,070.67
From rent of conduits and poles.....	1,093.35
From lighting public buildings	11,873.37
From accounts payable	6,440.32

Total from other sources..... 32,946.00

Grand total Appropriation and Receipts.... \$1,577,972.89

DISBURSEMENTS.

Investment Accounts:

Conduits	\$ 83,998.04
Cables	35,922.97
Belle Isle outfit.....	18,848.00
Buildings and wharf	109,945.60
Real estate	63,125.00
Shop machinery, tools, etc.....	7,866.71
Lines and poles.....	130,098.00
Towers and lamp posts.....	97,034.15
Steam plant	108,239.61
Electric plant, arc.....	58,483.65
Electric plant, incandescent.....	13,404.03
Railway track and track scales.....	10,982.31
Arc lamps	52,196.76

Total investment : 790,145.73

Operating Accounts:

City lighting expense from April 4, 1893, to June
30, 1896:

Office expense	\$ 17,853.51
Advertising	319.16
Public lighting from private companies.....	381,459.72
Fuel	17,162.20
Carbons	8,741.79
Pay rolls	56,178.13
Printing and Stationery.....	403.12
General supplies	4,366.37
Oils and rags	1,637.85
Teaming	2,192.60
Incandescent lamps	432.42
Globes and nets	676.93
	491,423.80
Operating expense 12 mos. to June 30, 1897....	110,141.38
Operating expense 12 mos. to June 30, 1898....	99,713.18
Cost of labor and material supplied other city de- partments	4,041.10
Inspection Department.....	5,118.85
Increase of stores.....	5,473.23
Accounts receivable	651.48
Worthless taxes 1893 charged back.....	1,227.77
Worthless taxes 1894 charged back.....	1,443.02
Worthless taxes 1895 charged back.....	1,706.93
Worthless taxes 1896 charged back.....	701.98
	5,079.70
Total disbursements	\$1,511,788.45
Total Appropriations and Receipts.....	1,577,972.89
Excess of Appropriations and Receipts....	\$ 66,184.44

Balance June 30, 1898:

City Treasurer	\$ 47,714.50
Secretary	439.86
Taxes unpaid of 1893.....	259.51
Taxes unpaid of 1894.....	1,082.57
Taxes unpaid of 1895.....	1,356.51
Taxes unpaid of 1896.....	2,719.60
Taxes unpaid of 1897.....	12,611.89
	66,184.44

CASH STATEMENT.

Twelve Months to June 30, 1898.

RECEIPTS.

From taxes prior to 1893.....	\$ 162.72
" taxes of 1893.....	200.89
" taxes of 1894.....	527.75
" taxes of 1895.....	1,344.16
" taxes of 1896.....	5,910.62
" taxes of 1897.....	192,168.11
" sale of old material.....	532.18
" work done for other city departments.....	3,226.18
" rental of poles and conduits.....	80.67
" Inspection Department	2,771.00
" decrease of stores.....	210.46
" lighting public building.....	359.76

	207,494.50

DISBURSEMENTS.

For 12 months' operating.....	99,713.18
" 12 months' construction	60,923.00
" Inspection Department	2,825.97
" work done for other city departments.....	3,093.01
" decrease in accounts payable.....	10,304.95

	176,860.11
Excess of Receipts	\$ 30,634.39

Balances June 30, 1897, were:

City Treasurer	\$ 17,186.01
Secretary	333.96

	\$ 17,519.97
Balances June 30, 1898, should be.....	\$ 48,154.36

Balances June 30, 1898, are:

City Treasurer	\$ 47,714.50
Secretary	439.86

	\$ 48,154.36

BALANCE SHEET, JUNE 30, 1898.

Unpaid taxes 1893.....	\$ 259.51
Unpaid taxes 1894.....	1,082.57
Unpaid taxes 1895.....	1,356.51
Unpaid taxes 1896.....	3,421.58
Unpaid taxes 1897.....	12,611.89
Commercial National Bank.....	651.48
City Treasurer's balance.....	47,714.50
Secretary's balance	439.86
Supplies in store:	
Coal	\$ 611.39
Carbons	3,990.21
Oils	97.47
Waste	3.50
Incandescent lamps	153.31
Globes and nets	408.35
Trans. ropes	200.00
	—
	5,473.23
Will F. Conant, balance held.....	110.27
Appro. bal. July 1, 1897.....	225,993.46
Incandescent lighting	359.76
Sale of old material.....	532.18
Rentals of poles and conduits.....	80.67
Taxes prior to 1893.....	162.72
Inspection Department, disbursements.....	2,825.97
Inspection Department, receipts.....	2,771.00
Foreign work, disbursements.....	3,093.01
Foreign work, receipts.....	3,226.18
Pay rolls	74,304.05
One year's operating expenses.....	99,713.18
One year's construction expenses.....	60,923.00
Accounts payable	6,330.05
	—
	\$313,870.34
	\$313,870.34

BALANCE SHEET—BOOKS CLOSED JUNE 30, 1898.

City of Detroit for taxes 1893.....	\$ 259.51
City of Detroit for taxes 1894.....	1,082.57
City of Detroit for taxes 1895.....	1,356.51
City of Detroit for taxes 1896.....	2,719.60
City of Detroit for taxes 1897.....	12,611.89
Treasurer City of Detroit.....	47,714.50
Secretary's petty cash	439.86
Commercial National Bank claim.....	651.48
W. F. Conant, amount withheld.....	110.27
Appropriations and Receipts unexpended.....	65,868.83
Total Appropriations and Receipts expended.....	1,491,424.09
Total amount expended for lighting and operating. 701,278.36	
Total amount expended for investment.....	790,145.73
Stores on hand.....	5,473.23
Accounts payable	6,330.05
	—————
	\$1,563,733.24
	\$1,563,733.24

ASSETS AND LIABILITIES.

Unpaid taxes, 1893.....	\$ 259.51
Unpaid taxes, 1894.....	1,082.57
Unpaid taxes, 1895.....	1,356.51
Unpaid taxes, 1896.....	2,719.60
Unpaid taxes, 1897.....	12,611.89
Cash, City Treasurer.....	47,714.50
Cash, Secretary.....	439.86
Accounts receivable	651.48
Stores:	
Coal	\$ 611.39
Carbons	3,990.21
Oils	97.47
Waste	3.50
Globes and nets.....	408.35
Rope	209.00
Incand. lamps	153.31
	—————
	5,473.23
	————— \$72,309.15

LIABILITIES.

Accounts payable	\$ 6,330.05
	110.27
	—————
	6,440.32
Excess of assets (appro. bal.).....	\$65,868.83

CONSTRUCTION ACCOUNT.

Twelve Months to June 30, 1898.

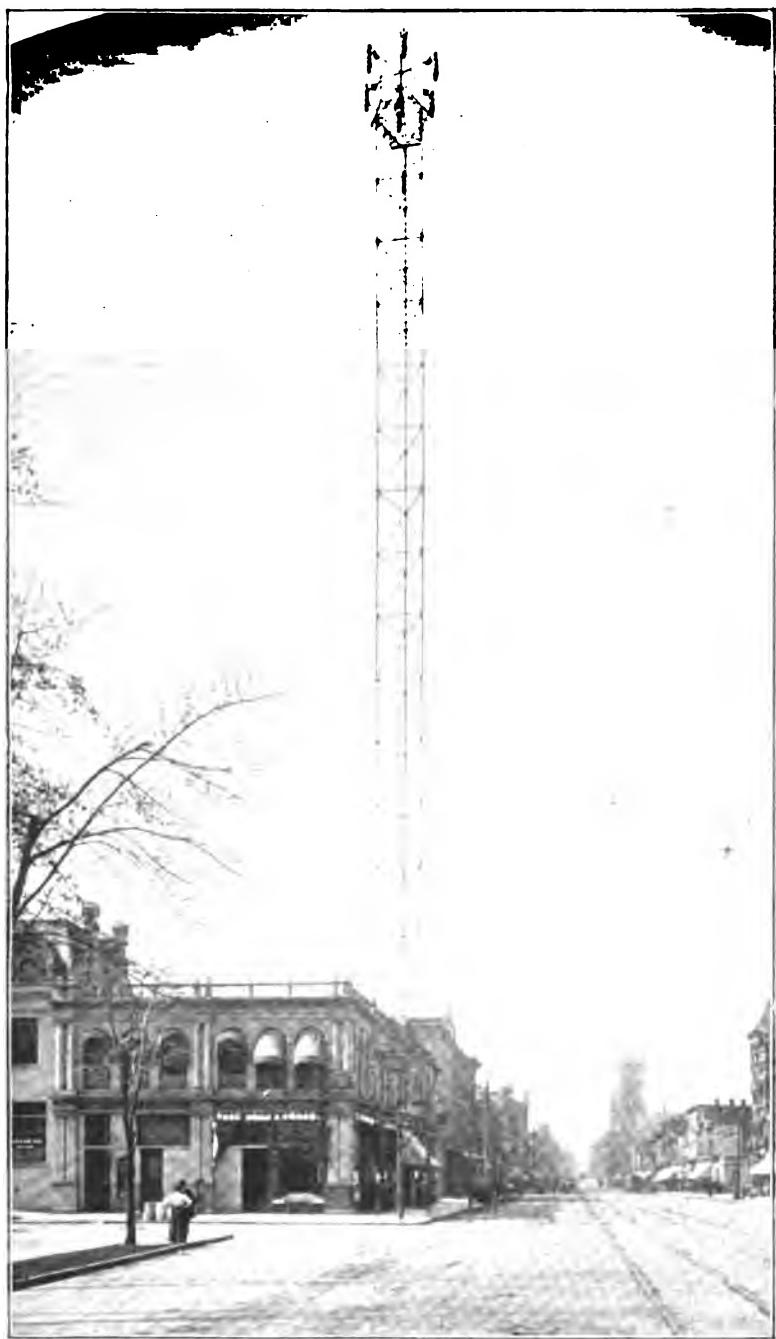
Conduits	\$ 11,127.35
Cables	4,740.78
Belle Isle outfit.....	11,026.15
Buildings and wharf.....	. 846.99
Shop machinery, tools, etc.....	2,175.40
Lines and poles.....	8,802.76
Towers and lamp posts.....	1,279.13
Steam plant	6,450.37
Electric plant, arc	6,002.84
Electric plant, incandescent.....	2,183.23
Railway track and scales.....	1,046.71
Arc lamps	5,241.29
Total	\$ 60,923.00

CLASSIFICATION OF OPERATING EXPENSES.

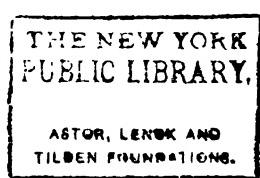
July, 1897.

Total Kilowatt Hour Output, 187,531.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 212.95	\$ 49.72	\$ 262.67	....
Steam plant	307.56	166.33	473.89	....
Electric plant	104.18	22.88	127.06	....
Tools and machinery	32.49	22.72	55.21	....
Conduits	68.05	21.55	89.60	....
Towers and lamp posts.....	335.55	71.59	407.14	....
Arc lamps	91.18	20.71	111.89	....
Lines	101.73	16.55	118.28	....
 Total maintenance.....	 \$1,253.69	 \$ 392.05	 \$1,645.74	 .00878
Executive:				
Sal'y Sec'y and City Elect..	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	64.04	64.04	....
Store room	106.04	....	106.04	....
Clerks and office expense...	160.69	50.91	211.60	....
Civil engr and drafting.....	148.32	9.62	157.94	....
 Total executive	 \$ 731.71	 \$ 124.57	 \$ 856.28	 .00457
Station Expense:				
Oils	\$	\$ 115.58	\$ 115.58	.00062
Waste .....	....	13.59	13.59	.00006
Coal .....	....	1,118.51	1,118.51	.00597
Miscellaneous supplies.....	....	30.03	30.03	.00015
Wages	1,739.04	....	1,739.04	.00928
 Total station	 \$1,739.04	 \$1,277.71	 \$3,016.75	 .91608
Lighting:				
Trimming arcs and patrol...	\$ 1,939.00	\$	\$ 1,939.00	....
Carbons .....	....	536.47	536.47	...
Incand, renewals .....	....	86.22	86.22	...
Incand. expense	112.91	18.53	131.44	...
Globes and nets.....	....	31.95	31.95	...
Miscellaneous, bags, etc.....	....	15.30	15.30	...
At Belle Isle.....	75.00	....	75.00	....
 Total lighting.....	 \$2,126.91	 \$ 688.47	 \$2,815.38	 .01502
Shop expense	\$ 101.20	\$ 42.40	\$ 143.60	.00077
Injuries and damages.....	....	....	....	....
 Total expenses	 \$5,952.55	 \$2,525.20	 \$8,477.75	 .04522



TOWER LIGHT.



CLASSIFICATION OF OPERATING EXPENSES.

August, 1897.

Total Kilowatt Hour Output, 211,497.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 91.27	\$ 51.98	\$ 143.25	....
Steam plant	230.75	70.42	301.17	....
Electric plant	78.47	12.94	91.41	....
Mis. tools and machinery....	33.30	42.23	75.53	....
Conduits	70.80	2.85	73.65	....
Towers and lamp posts.....	138.52	170.54	309.06	....
Arc lamps	44.49	15.98	60.47	....
Lines	99.47	15.13	114.60	....
 Total maintenance exp.....	 \$ 787.07	 \$ 382.07	 \$1,169.14	 .00552
Executive:				
Sal'y Sec'y and City Elect....	\$ 316.66	....	\$ 316.66	....
Printing and stationery.....	....	94.45	94.45	....
Store room	81.85	2.03	83.88	....
Office expense	151.66	12.37	164.03	....
Civil engr. and drafting.....	148.32	6.75	155.07	....
 Total executive exp.....	 \$ 698.49	 \$ 115.60	 \$ 814.09	 .00384
Station:				
Oils	\$	\$ 122.51	\$ 122.51	.00058
Waste .....	....	14.55	14.55	.00007
Coal .....	....	1,256.32	1,256.32	.00594
Miscellaneous .....	....	36.47	36.47	.00017
Wages	1,660.06	....	1,660.06	.00784
 Total station expense.....	 \$1,660.06	 \$1,429.85	 \$3,089.91	 .01460
Lighting:				
Trimming arcs and patrol....	\$ 1,939.96	\$ 7.25	\$ 1,947.21	....
Carbons .....	....	579.92	579.92	....
Incand. lamp renewals.....	....	72.32	72.32	....
Incand. lamp service exp....	18.19	18.00	36.19	....
Globes and nets.....	....	46.82	46.82	....
Miscel. bags, belts, etc.....	....	1.68	1.68	....
At Belle Isle Park.....	75.00	23.10	98.10	....
 Total lighting expense.....	 \$2,033.15	 \$ 749.09	 \$2,782.24	 .01314
Shop expense	\$ 135.61	\$ 21.54	\$ 157.15	.00074
Injuries and damages.....	....	....	....	....
 Total expense	 \$5,314.38	 \$2,698.15	 \$8,012.53	 .03784

CLASSIFICATION OF OPERATING EXPENSES.

September, 1897.

Total Kilowatt Hour Output, 242,155.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 98.60	\$ 37.92	\$ 136.52	....
Steam plant	127.97	15.70	143.67	....
Electric plant	62.38	20.43	82.81	....
Mis. tools and machinery....	21.82	31.96	53.78	....
Conduits	98.64	1.12	99.76	....
Towers and lamp posts.....	259.14	364.75	623.89	....
Arc lamps	65.24	28.69	93.93	....
Lines and cables	85.75	....	85.75	....
 Total maintenance exp....	 \$ 819.54	 \$ 500.57	 \$1,320.11	 .00545
Executive:				
Sal'y Sec'y and City Elect...\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	228.50	228.50	....
Store room	98.03	.10	98.13	....
Office expense	146.34	....	146.34	....
Civil engr. and drafting.....	83.32	8.63	91.95	....
 Total executive expense...\$ 644.35	 \$ 237.23	 \$ 881.58	 .00364	
Station:				
Oils	\$	\$ 85.85	\$ 85.85	.00037
Waste .....	....	13.95	13.95	.00006
Coal .....	....	1,368.36	1,368.36	.00565
Miscellaneous supplies .....	....	69.08	69.08	.00028
Wages	1,747.91	....	1,747.91	.00721
 Total station expense.....\$1,747.91	 \$1,537.24	 \$3,285.15	 .01357	
Lighting:				
Trimming and patrol.....\$1,885.00	\$.50	\$1,885.50	....
Carbons .....	....	570.69	570.69	....
Incand. lamp renewals.....	....	90.28	90.28	....
Incand. lamp service exp....	15.97	....	15.97	....
Globes and nets.....	....	39.37	39.37	....
At Belle Isle Park.....	75.00	1.76	76.76	....
 Total lighting expense....\$1,975.97	 \$ 702.60	 \$2,678.57	 .01106	
Shop	\$ 175.29	\$ 13.08	\$ 188.37	.00078
Injuries and damages.....	....	22.00	22.00	.00009
 Total expense	 \$5,363.06	 \$3,012.72	 \$8,375.78	 .03459

CLASSIFICATION OF OPERATING EXPENSES.

October, 1897.

Total Kilowatt Hour Output, 294,024.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 64.64	\$ 177.00	\$ 241.64	....
Steam plant	72.39	22.84	95.23	....
Electric plant	86.22	13.65	99.87	....
Tools and machinery, shop..	25.42	20.99	46.41	....
Conduits	29.12	....	29.12	....
Towers and lamp posts.....	151.94	29.93	181.87	....
Arc lamps	127.42	13.63	141.05	....
Lines	87.34	4.50	91.84	....
Total maintenance	\$ 644.49	\$ 282.54	\$ 927.03	.00315
Executive:				
Sal'y Sec'y and City Elect...	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	46.91	46.91	....
Store room	166.08	.50	166.58	....
Clerks and office expense....	105.81	13.00	118.81	....
Civil engr. and drafting.....	83.32	3.65	86.97	....
Total executive	\$ 671.87	\$ 64.06	\$ 735.93	.00250
Station Expense:				
Oils	\$	\$ 88.94	\$ 88.94	.00030
Waste .....	....	19.91	19.91	.00006
Coal .....	....	1,562.49	1,562.49	.00531
Miscellaneous supplies .....	....	94.59	94.59	.00033
Wages	1,953.50	....	1,953.50	.00665
Total station	\$1,953.50	\$1,765.93	\$3,719.43	.01265
Lighting Expense:				
Trimming arcs and patrol...\$1,749.00	\$ 1.00	\$1,750.00	....
Carbons .....	....	684.73	684.73	....
Incand. lamp renewals.....	....	73.07	73.07	....
Incand. lamp expense.....	13.66	28.56	42.22	....
Globes and nets.....	....	37.18	37.18	....
Miscellaneous bags, etc....	....	2.14	2.14	....
Belle Isle Park.....	75.00	93.13	168.13	....
Total lighting	\$1,837.66	\$ 919.81	\$2,757.47	.00940
Shop expense	\$ 101.47	\$ 6.84	\$ 108.31	.00036
Injuries and damages.....	....	52.50	52.50	.00018
Total expense.....	\$5,208.99	\$3,091.68	\$8,300.67	.02824

CLASSIFICATION OF OPERATING EXPENSES.

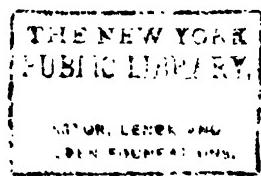
November, 1897.

Total Kilowatt Hour Output. 337,666.

Account.	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock.....	\$ 35.07	\$ 1.02	\$ 36.09	....
Steam plant	139.72	100.77	240.49	....
Electric plant	187.58	16.04	203.62	....
Mis. tools and machinery....	28.17	18.63	46.80	....
Conduits	43.42	13.83	57.25	....
Towers and lamp posts.....	58.00	32.00	90.00	....
Arc lamps	112.58	90.31	202.89	....
Lines	234.22	78.63	312.85	....
 Total maintenance	 \$ 838.76	 \$ 351.23	 \$1,189.99	 .00353
Executive:				
Sal'y Sec'y and City Elect...\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	13.11	13.11	....
Store room	123.99	....	123.99	....
Clerks and office expense....	65.00	17.25	82.25	....
Civil engr. and drafting.....	119.16	....	119.16	....
 Total executive	 \$ 624.81	 \$ 30.36	 \$ 655.17	 .00197
Station:				
Oils	\$	\$ 99.76	\$ 99.76	.00030
Waste .....	....	16.57	16.57	.00005
Coal .....	....	1,736.32	1,736.32	.00516
Miscellaneous supplies .....	....	59.77	59.77	.00016
Labor	1,871.80	....	1,871.80	.00555
 Total station	 \$1,871.80	 \$1,912.42	 \$3,784.22	 .01122
Lighting:				
Trimming arcs and patrol...\$1,695.00	\$	\$ 1,695.00	....
Carbons .....	....	773.69	773.69	....
Incand. lamp renewals.....	....	86.91	86.91	....
Incand. lamp expense.....	19.66	4.17	23.83	....
Globes and nets.....	....	39.91	39.91	....
Miscellaneous supplies.....	....	5.19	5.19	....
Belle Isle	75.00	6.30	81.30	....
 Total lighting	 \$1,789.66	 \$ 916.17	 \$2,705.83	 .00802
Shop expense	\$	\$ 22.13	\$ 22.13	.00006
Injuries and damages .....	....	34.75	34.75	.00010
 Total expense	 \$5,125.03	 \$3,267.06	 \$8,392.09	 .02490



CRANE LIGHT.



CLASSIFICATION OF OPERATING EXPENSES.

December, 1897.

Total Kilowatt Hour Output, 373,632.

Account.	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....\$ 68.97	\$ 6.71	\$ 75.68	....
Steam plant	96.19	94.37	190.56	....
Electric plant	168.58	70.17	238.75	....
Miscel. tools and mach'y....	43.84	35.20	79.04	....
Conduits	40.56	13.00	53.56	....
Towers and lamp posts.....	16.36	....	16.36	....
Arc lamps	215.48	84.70	300.18	....
Lines	307.48	74.70	382.18	....
 Total maintenance	\$ 957.46	\$ 378.85	\$1,336.31	.00358
Executive:				
Sal'y Sec'y and City Elect...\$ 316.66	....	\$ 316.66	....
Printing and stationery.....	....	22.68	22.68	....
Store room	101.08	.40	101.48	....
Clerks and office expense....	78.50	16.38	94.88	....
Civil engr. and drafting....	91.66	....	91.66	....
 Total executive	\$ 587.90	\$ 39.46	\$ 627.36	.00168
Station:				
Oils	\$	\$ 83.32	\$ 83.32	.00023
Waste .....	....	20.11	20.11	.00005
Coal .....	....	1,848.75	1,848.75	.00495
Miscellaneous supplies .....	....	38.40	38.40	.00010
Wages	1,955.03	....	1,955.03	.00523
 Total station	\$1,955.03	\$1,990.58	\$3,945.61	.01056
Lighting:				
Trimming and patrolling....\$1,749.00	\$	\$1,749.00	....
Carbons .....	....	806.01	806.01	....
Incand. lamp renewals .....	....	85.84	85.84	....
Incand. lamp expense.....	12.75	8.72	21.47	....
Globes and nets.....	....	38.77	38.77	....
Miscellaneous	2.19	41.09	43.28	....
Belle Isle Park.....	75.00	....	75.00	....
 Total lighting.....	\$1,838.94	\$ 980.43	\$2,819.37	.00754
Shop expense .....	....	\$ 7.46	\$ 7.46	.00002
Injuries and damages.....	....	2.00	2.00	.00000
 Total expense.....	\$5,339.33	\$3,398.78	\$8,738.11	.02338

CLASSIFICATION OF OPERATING EXPENSES.

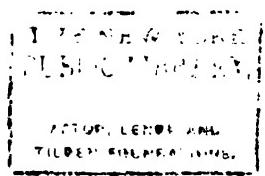
March, 1898.

Total Kilowatt Hour Output, 299,090.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Buildings, track, dock, etc....	\$ 33.91	\$ 6.33	\$ 40.24	.....
Steam plant	131.18	224.21	355.39	.....
Electric plant	473.07	170.36	643.43	.....
Tools and machinery.....	35.89	10.48	46.37	.....
Conduits	81.24	3.00	84.24	.....
Towers and lamp posts.....	103.60	1.33	104.93	.....
Arc lamps	210.29	80.08	290.37	.....
Lines	267.95	111.45	379.40	.....
Total maintenance.....	\$1,337.13	\$ 607.24	\$1,944.37	.00650
Executive:				
Salary Secy. and City Electr.	\$ 316.66	....	\$ 316.66	.....
Printing and stationery.....	....	10.21	10.21	.....
Store room.....	71.20	....	712.0	.....
Clerks and office expenses...	129.87	2.50	132.37	.....
Civil engr. and drafting.....	91.66	2.64	94.30	.....
Total executive.....	\$ 609.39	\$ 15.35	\$ 624.74	.00209
Station expenses:				
Oils .....	....	\$ 77.06	\$ 77.06	.00026
Waste .....	....	19.50	19.50	.00006
Coal .....	....	1,604.08	1,604.08	.00537
Miscellaneous supplies...	....	196.60	196.60	.00066
Wages	1,883.07	....	1,883.07	.00629
Total station.....	\$1,883.07	\$1,897.24	\$3,780.31	.01264
Lighting:				
Trimming arcs and patrol...	\$1,749.00	....	\$1,749.00	.....
Carbons .....	....	654.00	654.00	.....
Incand. renewals .....	....	55.38	55.38	.....
Incand. expense	25.31	11.25	36.56	.....
Globes and nets.....	....	24.07	24.07	.....
Miscellaneous supplies .....	....	11.78	11.78	.....
Belle Isle	75.00	10.00	85.00	.....
Total lighting	\$1,849.31	\$ 766.48	\$2,615.79	.00875
Shop expense .....	....	\$ 42.59	\$ 42.59	.00014
Injuries and damages.....	....	115.50	115.50	.00038
Total expense	\$5,678.90	\$3,444.40	\$9,123.30	.03050
March, 1897.....	\$6,221.01	\$3,241.21	\$9,462.22	.03541



CENTER SUSPENSION LIGHT.



CLASSIFICATION OF OPERATING EXPENSES.

April, 1898.

Total Kilowatt Hour Output, 249,332.

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Buildings, track, dock, etc....	\$ 72.31	\$ 10.63	\$ 82.94	....
Steam plant	95.66	3.11	98.77	....
Electric plant.....	190.52	186.92	377.44	....
Tools and machinery.....	93.11	6.68	99.79	....
Conduits	25.88	....	25.88	....
Towers and lamp posts.....	5.55	3.98	9.53	....
Arc lamps	228.04	90.33	318.37	....
Lines	290.95	85.73	376.68	....
 Total maintenance	 \$1,002.02	 \$ 387.38	 \$1,389.40	 .00558	
Executive:					
Salary Secy. and City Electr.	\$ 316.66	....	\$ 316.66	....
Printing and stationery.....	....	6.90	6.90	....
Store room	71.40	.15	71.55	....
Clerks and office expenses...	128.00	1.39	129.39	....
Civil engr. and drafting.....	104.16	1.08	105.24	....
 Total executive	 \$ 620.22	 \$ 9.52	 \$ 629.74	 .00252	
Station expenses:					
Oils .....	....	\$ 68.53	\$ 68.53	.00028	
Waste .....	....	18.95	18.95	.00007	
Coal .....	....	1,361.82	1,361.82	.00545	
Miscellaneous supplies ..	....	63.45	63.45	.00026	
Wages	1,836.78	....	1,836.78	.00737	
 Total station.....	 \$1,836.78	 \$1,512.75	 \$3,349.53	 .01343	
Lighting:					
Trimming arcs and patrol...	\$1,497.50	....	\$1,497.50	....
Carbons .....	....	587.00	587.00	....
Incand. renewals .....	....	70.11	70.11	....
Incand. expense	10.42	....	10.42	....
Globes and nets.....	....	63.76	63.76	....
Miscellaneous supplies	132.72	153.99	286.71	....
Belle Isle	75.00	....	75.00	....
 Total lighting.....	 \$1,715.64	 \$ 874.86	 \$2,590.50	 .01039	
Shop expense					
Injuries and damages.....	....	\$ 14.13	\$ 14.13	.00006	
 Total expense.....	 \$5,174.66	 \$2,798.64	 \$7,973.30	 .03198	
April, 1897.....	\$6,007.51	\$2,662.92	\$8,670.43	.03928	

CLASSIFICATION OF OPERATING EXPENSES.

May, 1898.

Total Kilowatt Hour Output, 223,829.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Buildings; track, dock, etc...\$	65.19	\$ 59.18	\$ 124.37	....
Steam plant	96.67	9.05	105.72	....
Electric plant.....	152.81	24.13	176.94	....
Tools and machinery.....	50.87	30.29	81.16	....
Conduits	34.50	....	34.50	....
Towers and lamp posts.....	28.90	12.11	41.01	....
Arc lamps	231.22	57.77	288.99	....
Lines	349.19	106.31	455.50	....
 Total maintenance.....	 \$1,009.35	 \$ 298.84	 \$1,308.19	 .00584
Executive:				
Salary Secy. and City Electr.\$	316.66	....	\$ 316.66	....
Printing and stationery.....	....	12.84	12.84	....
Store room.....	66.80	2.00	68.80	....
Clerks and office expenses...	125.78	16.74	142.52	....
Civil engr. and drafting.....	111.66	.48	112.14	....
 Total executive.....	 \$ 620.90	 \$ 32.06	 \$ 652.96	 .00292
Station expenses:				
Oils .....	....	\$ 74.30	\$ 74.30	.00033
Waste .....	....	18.30	18.30	.00008
Coal .....	....	1,311.03	1,311.03	.00586
Miscellaneous supplies .....	....	36.59	36.59	.00017
Wages	1,879.94	....	1,879.94	.00839
 Total station	 \$1,879.94	 \$1,440.22	 \$3,320.16	 .01483
Lighting:				
Trimming arcs and patrol...\$	1,565.50	....	\$1,565.50	....
Carbons .....	....	571.11	571.11	....
Incand. renewals.....	....	112.09	112.09	....
Incand. expense.....	14.23	3.00	17.23	....
Globes and nets.....	....	51.28	51.28	....
Miscellaneous supplies	30.54	72.09	102.63	....
Belle Isle	75.00	1.71	76.71	....
 Total lighting.....	 \$1,685.27	 \$ 811.28	 \$2,496.55	 .01116
Shop expense.....	....	\$ 3.35	\$ 3.35	.00001
Injuries and damages.....	....	....	....	....
 Total expense	 \$5,195.46	 \$2,585.75	 \$7,781.21	 .03476
May, 1897.....	\$5,658.29	\$2,377.02	\$8,035.31	.04102

CLASSIFICATION OF OPERATING EXPENSES.

June, 1898.

Total Kilowatt Hour Output, 197,074.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Buildings, track, dock, etc....	\$ 88.14	\$ 7.86	\$ 96.00	....
Steam plant	65.45	19.96	85.41	....
Electric plant	210.73	23.52	234.25	....
Tools and machinery.....	56.47	1.47	57.94	....
Conduits	44.28	1.00	45.28	....
Towers and lamp posts.....	64.61	2.63	67.24	....
Arc lamps	195.06	59.74	254.80	....
Lines	223.36	13.24	236.60	....
 Total maintenance.....	 \$ 948.10	 \$ 129.42	 \$1,077.52	 .00547
Executive:				
Salary Secy. and City Electr.	\$ 316.66	....	\$ 316.66	....
Printing and stationery.....	....	20.79	20.79	....
Store room	66.25	....	66.25	....
Clerks and office expenses...	129.75	.45	130.20	....
Civil engr. and drafting.....	131.66	67.18	198.84	....
 Total executive.....	 \$ 644.32	 \$ 88.42	 \$ 732.74	 .00372
Station expenses:				
Oils .....	....	\$ 71.01	\$ 71.01	.00036
Waste .....	....	20.02	20.02	.00010
Coal .....	....	1,116.37	1,116.37	.00568
Miscellaneous supplies .....	....	26.42	26.42	.00011
Wages	1,842.35	....	1,842.35	.00936
 Total station.....	 \$1,842.35	 \$1,233.82	 \$3,076.17	 .01561
Lighting:				
Trimming arcs and patrol...\$1,515.00	....	....	\$1,515.00	....
Carbons .....	....	547.55	547.55	....
Incand. renewals.....	....	38.39	38.39	....
Incand. expense.....	16.99	....	16.99	....
Globes and nets.....	....	31.32	31.32	....
Miscellaneous supplies.....	....	10.75	10.75	....
Belle Isle	75.00	.50	75.50	....
 Total lighting	 \$1,606.99	 \$ 628.51	 \$2,235.50	 .01134
Shop expense.....	....	\$ 2.72	\$ 2.72	.00001
Injuries and damages.....	....	....	....	....
 Total expense.....	 \$5,041.76	 \$2,082.89	 \$7,124.65	 .03615
June, 1897.....	\$5,592.81	\$2,452.40	8,045.21	.04567

CLASSIFICATION OF OPERATING EXPENSES.

For 12 Months to June 30, 1898.

Total Kilowatt-Hour Output, 3,281,615.

Account.	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Buildings, track, dock, etc..	\$ 1,010.71	\$ 442.15	\$1,452.86	....
Steam plant	1,551.90	779.26	2,331.16	....
Electric plant	2,191.46	849.73	3,041.19	....
Mis. tools, machinery, etc...	472.21	252.96	725.17	....
Conduits	617.81	79.98	697.79	....
Towers and lamp posts....	1,311.84	780.54	2,092.38	....
Arc lamps	1,752.30	687.72	2,440.02	....
Lines	2,912.09	612.95	3,525.04	....
 Total maintenance.....	 \$11,820.32	 \$4,485.29	 \$16,305.61	 .00497	
Executive:					
Sal'y Sec'y and City Electr.	\$ 3,799.92	....	\$3,799.92	....
Printing and stationery....	....	574.44	574.44	....
Store room	1,139.98	5.63	1,145.61	....
Clerks and office expenses..	1,410.43	141.16	1,551.59	....
Civil engr. and drafting....	1,296.56	102.45	1,399.01	....
 Total executive.....	 \$ 7,646.89	 \$ 823.68	 \$8,470.57	 .00258	
Station:					
Oils .....	....	\$1,058.16	\$1,058.16	.00032	
Waste .....	....	212.67	212.67	.00007	
Coal .....	....	17,857.72	17,857.72	.00544	
Miscellaneous supplies ....	....	954.50	954.50	.00029	
Wages	22,004.39	....	22,004.39	.00670	
 Total station.....	 \$22,004.39	 \$20,083.05	 \$42,087.44	 .01282	
Lighting:					
Trimming and patrolling...	\$20,619.96	8.75	\$20,628.71	....
Carbons .....	....	7,765.82	7,765.82	....
Incand. lamp renewals.....	....	956.70	956.70	....
Incand. lamp expense.....	328.64	124.52	453.16	....
Globes and nets.....	....	460.61	460.61	....
Miscellaneous	175.56	319.61	495.17	....
Belle Isle Park.....	900.00	145.30	1,045.30	....
 Total lighting	 \$22,024.16	 \$9,781.31	 \$31,805.47	 .00069	
Shop expense	\$ 513.57	\$ 202.82	\$ 716.39	.00022	
Injuries and damages.....	....	327.70	327.70	.00010	
 Total expense.....	 \$64,009.33	 \$35,703.85	 \$99,713.18	 .03038	

CLASSIFICATION OF OPERATING EXPENSES.

For 12 Months to June 30, 1897.

Total Kilowat Hour Output, 2,980,412.

Account.	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance Accounts:				
Buildings, wharf, track.....\$ 583.82	\$ 226.89	\$ 810.71		....
Steam plant	1,491.60	1,053.04	2,544.64	....
Electric plant	1,027.08	434.21	1,461.29	....
Tools and machinery.....	142.44	404.19	546.63	....
Conduits	1,258.50	96.46	1,354.96	....
Towers and lamp posts.....	3,080.68	975.58	4,056.26	..
Arc lamps	3,092.33	732.01	3,824.34	....
Lines and cables.....	5,982.36	999.87	6,982.23	....
 Total maintenance.....	 \$16,658.81	 \$ 4,922.25	 \$21,581.06	 .00724
Executive Accounts :				
Salaries, City Elec. and Sec. \$ 3,700.00		....	\$ 3,700.00	....
Printing and stationery.....	....	962.08	962.08	....
Store room	1,199.92	19.79	1,219.71	....
Clerks and office expense..	2,290.73	49.23	2,339.96	....
Civil engr. and drafting....	1,693.07	38.47	1,731.54	....
 Total executive expense..	 \$ 8,883.72	 \$ 1,069.57	 \$ 9,953.29	 .00333
Station Expense Accounts:				
Oils .....	....	\$ 1,445.55	\$ 1,445.55	.00049
Waste .....	....	250.68	250.68	.00009
Coal	184.35	16,532.80	16,717.15	.00561
Miscellaneous supplies....	713.54	1,682.75	2,396.29	.00070
Wages	19,966.69	....	19,966.69	.00681
 Total station expense....	 \$20,864.58	 \$19,911.78	 \$40,776.36	 .01370
Trimming Expense Accounts:				
Lamps	\$23,189.00	\$ 67.76	\$23,256.76	....
Carbons .....	....	7,118.05	7,118.05	....
Renewals .....	....	662.33	662.33	....
Lamp expense	595.80	189.88	785.68	....
Globes and nets.....	....	492.90	492.90	....
Miscellaneous expense....	....	95.66	95.66	....
 Total trimming expense..	 \$23,784.80	 \$ 8,626.58	 \$32,411.38	 .01088
Shop Expense Accounts:				
Wages, master mech., etc..	....	....	\$ 4,545.41	....
Supplies .....	....	662.38	662.38	....
 Total shop expense.....	 \$ 4,545.41	 \$ 662.38	 \$ 5,207.79	 .00174
Injuries and Damages:				
Miscellaneous	\$ 13.50	\$ 198.00	\$ 211.50	.00007
 Total oper. and maint'ce.	 \$74,750.82	 \$35,390.56	 \$110,141.38	 .03696

Note.—During the 12 months ending June 30, 1898, the shop expense was charged direct to the proper operating account.

OFFICE OF CITY ACCOUNTANT.

Detroit, June 30th, 1898.

To Hon. R. H. Fyfe,
President Public Lighting Commission.

Sir:—

I have examined the books of the Public Lighting Commission and beg to report the condition as follows:

July 1st, 1897, to June 30th, 1898.	
Cash balance July 1st, 1897.....	\$ 17,186.01
Receipts from taxes of 1897.....	192,168.11
Receipts from taxes of 1896.....	5,910.62
Receipts from taxes of 1895.....	1,344.16
Receipts from taxes of 1894.....	527.75
Receipts from taxes of 1893.....	200.89
Receipts from taxes prior to 1893.....	162.72
Receipts from Secretary's deposits for 12 months.....	6,927.87
Receipts from error in Voucher No. 4,312, Richmond & Backus, credited to City Treasury and afterwards charged back....	1.00
Total cash receipts.....	\$224,429.13

DISBURSEMENTS.

Total disbursements to May 31st, 1898, as per Pub-	
lic Lighting books.....	\$176,315.69
Pay rolls for 1st half of June, 1898, paid by City Treasurer	2,754.95

Total disbursements P. L. C. books..... \$179,070.64

Less the following vouchers not yet reached
the Controller:

No. 4563-4626 for May, 1898.....	\$1,345.33
4545 West. Elec. Co.....	804.00
4540 Strelinger Co.	4.50
4515 Fostoria Inned. Co.....	64.00
4514 Ferguson Co., Ltd.....	9.83
4501 Buhl Sons & Co.....	5.35
4473 Strelinger Co.	1.25
4383 Noble & Co.....	114.40
4374 Hurley	5.15
4294 Hurley	2.20
	2,356.01

Total disbursements (agrees with Controller)..... \$176,714.63

Cash balance (agrees with City Treasurer)..... \$ 47,714.50

Yours very truly,

JAMES T. STERLING,
City Accountant.

Office City Treasurer.

Detroit, June 30, 1898.

Hon. R. H. Fyfe,
President Public Lighting Commission,
Detroit, Michigan:

Dear Sir:—

The books of this office show that for the fiscal year ending with June 30, 1898, the receipts and disbursements for account of the Public Lighting Commission have been as follows:

Balance July 1, 1897.....	\$ 17,186.01
Receipts from sundry sources.....	207,242.12
	—————
Total	\$224,428.13
Total vouchers paid	176,713.63
	—————
Balance June 30, 1898.....	\$ 47,714.50

I have the honor to be,

Yours respectfully,

WM. B. THOMPSON,

City Treasurer.

OFFICE OF THE PUBLIC LIGHTING COMMISSION.

STATE OF MICHIGAN,
County of Wayne,
ss.

Ford Starring, Secretary of the Public Lighting Commission, being duly sworn, says, that the accounts of the Public Lighting Commission have been examined and verified by him from April 4th, 1893, to June 30th, 1898, and that the statements published herewith are statements drawn correctly from the books of the Commission.

(Signed) FORD STARRING.

Subscribed and sworn to before me
this 12th day of July, 1898.

A. S. GUERIN,

Notary Public, Wayne Co., Mich.

Detroit, July 12th, 1898.

Hon. R. H. Fyfe,
President Public Lighting Commission.

Dear Sir:—

This is to certify that the disbursement vouchers of the Commission for the fiscal year ending June 30, 1898, and amounting to \$176,713.63, have been examined by the Auditing Committee and approved.

C. H. RITTER,
FREDK. F. INGRAM,
Auditing Committee.



FOURTH

ANNUAL REPORT

OF THE

Public
Lighting
Commission

OF THE

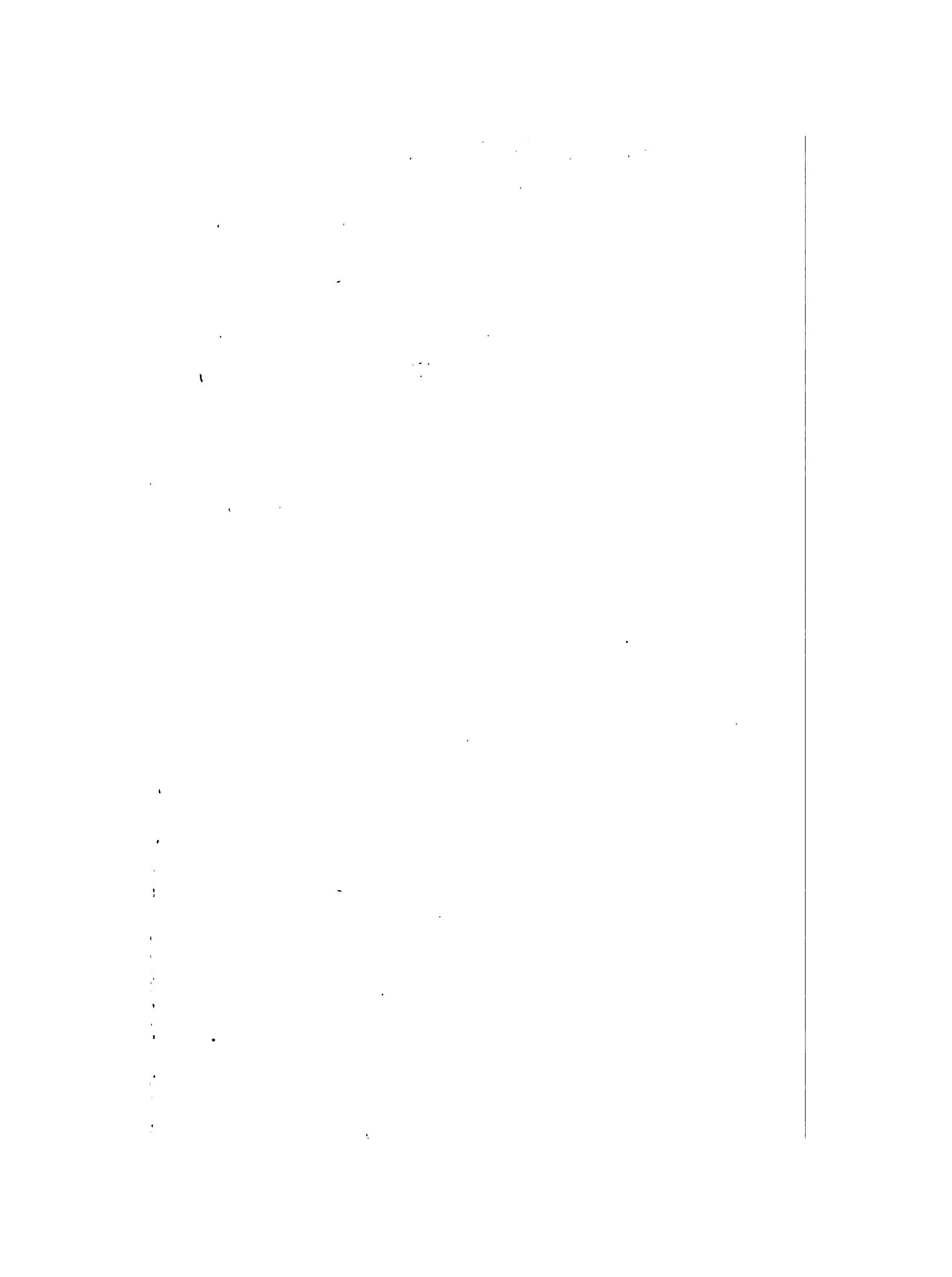
CITY OF DETROIT

MICHIGAN



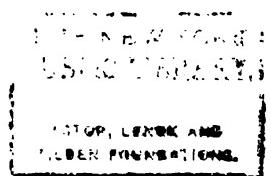
FISCAL YEAR ENDING JUNE 30TH, 1899

VGS





POST LIGHT.



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THE RICHMOND & BACKUS CO.,
 STATIONERS, PRINTERS
 AND BINDERS,
 DETROIT, MICH.



...FOURTH...

ANNUAL REPORT

OF THE

Public Lighting Commission.

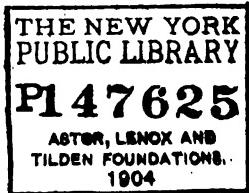
Fiscal Year ending June 30, 1899.

THE COMMISSION.

CHAS. H. RITTER, President.....	Term expires April 4, 1900
JOHN MINER, Vice-President.....	Term expires April 4, 1902
D. W. SIMONS.....	Term expires April 4, 1905
RICHARD H. FYFE.....	Term expires April 4, 1901
WM. A. LIVINGSTONE.....	Term expires April 4, 1903
FREDK. F. INGRAM.....	Term expires April 4, 1904

FORD STARRING	Secretary.
W. D. STEELE....	City Electrician and General Superintendent.
JOHN DONALDSON.....	Chief Engineer.
J. F. LEWIS.....	Outside Superintendent.

Custodian of Funds.....	W. B. THOMPSON, City Treasurer.
Auditor of Accounts.....	F. A. BLADES, City Controller.
City Accountant.....	FRANCIS J. DUCAT.



The Ex-Members of the Commission are:

- C. A. Newcomb, April, 1893, to July, 1893.
- Martin Butzel, April, 1893, to April, 1895.
- George H. Lothrop, April, 1893, to April, 1896.
- W. A. Jackson, April, 1893, to July, 1896.
- Edwin Henderson, April, 1896, to December, 1896.
- W. R. Farrand, April, 1893, to April, 1897.
- J. L. Hudson, April, 1893, to May, 1898.
- John Atkinson, July, 1896 to July, 1898.



Detroit, July 31st, 1899.

To The Honorable The Common Council,
City of Detroit, Michigan.

Gentlemen:—

The Public Lighting Commission respectfully submits for your consideration the accompanying report of the business intrusted to their care during the fiscal year ending June 30, 1899. In the report an effort has been made to present such data as will best convey an understanding as to the work done, the costs of Municipal Lighting and as to the condition of the city's investment.

We have the honor to be the

PUBLIC LIGHTING COMMISSION,
By C. H. RITTER, President,
FORD STARRING, Secretary.

**COMMISSIONERS:**

C. H. RITTER, PRESIDENT.

R. M. FYFE,	W. A. LIVINGSTONE,
JOHN MINER,	F. F. INGRAM,
D. W. SIMONS.	

FORD STARRING, SECRETARY.
W. D. STEELE, CITY ELECTRICIAN.

DETROIT, AUGUST 8TH, '99.

To the Honorable the Public Lighting Commissioners:

Gentlemen:—In presenting this, the fourth annual report, covering the business of this Commission for the fiscal year ending with June 30th, 1899, I am pleased to be able to show a marked decrease in the cash expenditures, and to state that the same was attained without in any way affecting the efficiency of the working force, or in any manner neglecting the property of the city.

As compared with the preceding year the street lighting has been increased from an average of 1,744 arc lights of 2,000 candle power each to 1,868 arc lights of 2,000 candle power each, and the electrical output from 3,281,615 kilowatt hours to 3,539,567 kilowatt hours, while the total cash expended for the operating and maintenance of the entire plant has been reduced from \$99,713.18 to \$96,665.03, bringing the cash outlay per arc light per year down from \$51.85 to \$46.46.

The above saving of \$3,048.15 appears in comparing the costs of the different departments as follows:

FOR STORES.

	Increase.	Decrease.
Maintenance	\$ 772.30	.....
Executive .....	.....	\$ 41.65
Station .....	.....	300.70
Lighting .....	.....	1,652.82
Shop .....	.....	80.65
Injuries and damages.....	.....	29.60
Net reduction in stores.....	1,333.12
	\$2,105.42	\$2,105.42

PUBLIC LIGHTING COMMISSION.

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FOR WAGES.

	Increase.	Decrease.
Maintenance	\$ 335.68
Executive	\$ 256.79
Station	534.76
Lighting .....	.....	807.59
Shop .....	.....	513.57
Injuries and damages.....	62.00	.....
Net decrease in wages.....	<u>1,715.03</u>	.....
	<u>\$2,112.71</u>	<u>\$2,112.71</u>

The reduction of wages in the lighting department is due to the introduction on April 1, 1899, of longer burning carbons, permitting the "Brush" double carbon lamps to be trimmed on alternate days instead of daily, as prior to that date. This saving will be more marked during the ensuing year.

To arrive at the approximate cost of an arc lamp to the City of Detroit the plan is followed that was adopted by the Commission in its preceding report, that is, to compute the fixed charges on a basis of 3 per cent. on the investment for depreciation, of 4 per cent. on the investment for interest, and at the regular rate for taxes on the assessed value of \$400,000 for lost taxes. The result of such computation is as follows:

The present investment, less the amounts already charged off for depreciation, is \$751,157.74.

The assessed value of the plant is \$400,000, and the rate of taxes for both the city and county is \$19.57 per \$1,000 of assessed value.

Depreciation at 3 per cent. is.....	\$ 22,534.71
Interest at 4 per cent. is.....	30,046.28
Loss of taxes is.....	7,828.00
A total of.....	<u>\$ 60,408.99</u>

The amount of fixed expense chargeable to arc lighting, proportioned on the electrical output, per arc light per annum, is:

Depreciation	\$ 10.85
Interest	14.48
Loss of taxes.....	3.77
Total fixed charges.....	\$ 29.10
Adding cash cost.....	<u>46.46</u>
Approximate cost to city is.....	\$ 75.56

The method of computing the cost of an arc light which this Commission adopted drew forth some criticism when it first appeared in our annual report of last year.

The question of the best method of arriving at the real cost to the taxpayer of an arc light supplied by the plant owned and operated by the City of Detroit, was carefully considered before the result and the method by which it was reached was given to the public. In the effort to arrive at a correct solution of the question the Commission was not embarrassed by any interests or influences which would operate to obscure the object of its investigation. Though the matter has since been the subject of reconsideration by the Commission there has been discovered no sufficient reason to alter the conclusion or to change the method by which it was reached.

It is not out of place to suggest that the question of cost to the public of an arc light ought to be determined independent of its relation to, or its bearing upon, the other and greater question of the expediency of municipal ownership of an electric lighting plant, which seems to be the one primarily in the minds of the critics. So far as the latter question is concerned, it is not open to this Commission to discuss. It may be remarked, however, that the mere money cost of an arc light is not a satisfactory standard by which it may be absolutely determined.

To a strict adherence to the policy which assured the working force of the Commission a tenure of position dependent solely upon good behavior and the system of promotion in service according to merit which has always prevailed, the success which has thus far attended the administration of this department of the city's government, is mostly due. The Commission has had occasion to call attention to the importance of this subject. The work of the past year confirms its belief, and has served to emphasize the necessity of a rigid adherence to this principle.

The nature, as well as the regularity and exactness required in the execution, of the duties of the regular employes of the Commission places the public lighting department in a situation distinct in many respects from other departments of the public service. A departure from this policy would result in decreasing not alone the uniform efficiency of the service but also seriously interfering with its economical administration.

Yours truly,



President.

THE CITY'S LIGHTING PLANT.

The City's Lighting Plant now consists of the following:

LAMPS.

- 1,725 double carbon Brush lamps.
- 219 single carbon Adams-Bagnall lamps.

BOILER HOUSE.

Seven Double Deck Tubular Boilers, C. C. Peck design; each boiler has 3,000 square feet of heating surface and is equipped with the Hawley Down Draft Furnace and Hoppes Live Steam Purifier and Worthington Water Meter. The coal is handled in one-ton charging cars on a Hunt Industrial Railway. Coal bins of 800 tons capacity adjoin the firing floor.

PUMP ROOM.

One Fire Pump of 1,000 gallons per minute capacity. This pump is connected to a complete system of fire mains and is always under steam. It is used during the day time to feed the boilers and to operate a water motor which runs the machine shop.

One Worthington Pressure Pattern Feed Pump, in reserve, of 100 gallons per minute capacity. This is connected to a duplicate boiler feed system.

Two Worthington Jet Condensers, with feed pumps attached. Either condenser will condense 36,000 pounds of steam per hour, and the auxiliary feed pump can feed the same amount of water to the boiler. All of the water used in the operation of the plant is pumped by the above machinery from the Detroit River.

One Wainwright heater, which utilizes the exhaust steam from the pumps and small engines in heating the boiler feed water.

One Westinghouse Air Compressor, which supplies the compressed air for cleaning machinery.

ENGINE ROOM.

ARC LIGHTING PLANT:

Five triple expansion, marine type engines; 200 revolutions per minute, 160 pounds steam pressure; 25-inch vacuum; cylinders 11 $\frac{1}{4}$ inch, 18 inches and 29 inches in diameter, and 18 inch stroke; horse power at maximum efficiency, 340.

Twenty 50-Kilowatt; four pole, Western Electric arc dynamos for constant current at 9.6 amperes; speed, 500 revolutions per minute. Four dynamos are driven by each engine, the connection being 7 $\frac{1}{2}$ -inch cotton ropes to each dynamo.

Three 57 $\frac{1}{2}$ Kilowatt, two pole, Western Electric arc dynamos for constant current at 9.6 amperes; speed, 465 revolutions per minute. Each direct connected to triple expansion Willan's center-valve engines.

INCANDESCENT LIGHTING PLANT:

Three compound Westinghouse engines, run non-condensing; cylinders 9-inch and 15-inch, with 9-inch stroke; speed, 350 revolutions per minute.

Three 55-Kilowatt, 2-phase, Westinghouse alternators, belt driven. Alternators are run in parallel; 1,100 volts primary, 110 volts secondary.

Two excitors; one belt driven and one direct-connected to a Westinghouse standard engine.

LINES AND POLES.

The overhead lines of the plant are strung on a total of 6,673 poles, owned as follows:

Public Lighting Commission.....	5,560
Fire Commission	527
Police Commission	399
Peninsular Electric Lighting Co.....	72
Michigan Telephone Co.....	59
Detroit Street Railways.....	35
Edison Illuminating Co.....	5
Detroit Telephone Co.....	16
 Total	 6,673

The poles of the Public Lighting Commission are used by other parties as follows:

Fire Commission	891	poles,	1,860	contacts.
Police Commission	873	"	2,183	"
Edison Illuminating Co.....	142	"	522	"
Detroit Electric Light & Power Co....	213	"	429	"
Peninsular Electric Light Co.....	761	"	2,275	"
East Side Electric Co.....	70	"	140	"
Detroit Telephone Co.....	583	"	1,169	"
Michigan Telephone Co.....	112	"	146	"
Detroit Still Alarm Co.....	240	"	244	"
Strubel Bros.....	9	"	18	"
Parke, Davis & Co.....	1	"	2	"
Detroit Street Railways.....	266	"	for feeders.	
Detroit Street Railways.....	262	"	for span wires.	

The Public Lighting Commission has strung on poles a total of 405 miles of wire.

THE UNDERGROUND SERVICE.

Within the half-mile circle all the wires of the city are underground. The conduits vary in size from 2 ducts to 24 ducts, according to the possible demands upon them. The ducts are a special 3-inch vitrified tile laid in concrete.

The amount of conduits is as follows:

SIZE OF LINE.	LENGTH OF LINE.	FT. OF SINGLE DUCT.
2 duct.	210 ft. 2 in.	420 ft. 4 in.
4 "	3,777 " 6 "	15,110 " 0 "
6 "	1,815 " 7 "	10,893 " 6 "
9 "	21,340 " 9 "	192,066 " 9 "
10 "	138 " 1 "	1,380 " 10 "
12 "	95 " 0 "	1,140 " 0 "
15 "	560 " 10 "	8,412 " 6 "
16 "	2,104 " 8 "	33,674 " 8 "
24 "	347 " 2 "	8,332 " 0 "
Tunnel, 6' 2" x 3' 6"	231 " 0 "	.....
Tunnel, 5' 0" x 3' 0"	96 " 0 "	.....
Manholes	817 " 2 "	.....

Total 31,533 ft. 11 in. 271,430 ft. 7 in.

Of lateral conduits constructed of 2½-inch lap welded iron pipe there are 39,930 feet.

The following lead covered, rubber insulated cables are used in connection with the conduit system:

No. 4 B. & S., in arc light circuits.....	113,221 ft.
No. 4 B. & S., in incandescent feeders.....	36,576 "
No. 8 B. & S., in incandescent light mains.....	26,238 "

BELLE ISLE PARK.

All wires for electric lighting are placed underground, 52,000 feet of 3-inch wood conduit having been laid for this purpose, one-half of which is still unused. The bridge to the island and the more important points on the main roadways are lighted by arc lamps supported on ornamental iron posts. Thirty-nine arc lamps are used and they are operated as a part of the regular city circuits. Twenty-five thousand feet of No. 4 B. & S. gauge, lead covered cable is required for this service.

The buildings in the west end of the Park are lighted by incandescent lights, the current for which is obtained from mains connected with central transformer stations, where pairs of transformers receive three-phase alternating current at 3,500 volts and deliver two-phase alternating current at 116 volts. The crossing of the Detroit River with the three-phase feeder and the connection to the transformer stations is accomplished by the use of 14,500 feet of No. 6 B. & S. 3-conductor, lead covered and rubber insulated cable, a part of which is armored with iron wire and placed under the river. The secondary mains connecting the several buildings with the transformer house are made up of 5,800 feet of 2/0 2-conductor and 1,100 feet of No. 1 2-conductor, rubber insulated and lead covered cable and 3,000 feet of No. 4 single conductor cable.

COST OF THE CITY LIGHTING PLANT.

The City's investment proportioned between the incandescent and arc lighting on the basis of the electrical output is as follows:

	Arc.	Incandescent.	Total.
*Conduits	\$ 78,448.37	\$ 8,109.83	\$ 86,558.20
Cables	33,701.84	3,485.20	37,187.04
Real Estate	57,222.81	5,902.19	63,125.00
Buildings and Wharf.	99,718.69	10,285.81	110,004.50
Lines and poles	123,302.78	12,760.70	136,063.48
Towers and lamp posts.	97,436.95	.....	97,436.95
Arc plant	60,885.73	.....	60,885.73
Incandescent plant . . . . .	.....	13,404.03	13,404.03
Steam plant	101,366.28	10,481.19	111,847.47
Railway track and scales.	9,955.43	1,026.88	10,982.31
Machine shop	7,263.88	750.28	8,014.16
Arc lamps and switches.	54,066.59	.....	54,066.59
 Total	 \$723,369.35	 \$66,206.11	 \$789,575.46
Belle Isle lines, lamps, etc. . . . .	.....	.....	24,228.01
 Grand total . . . . .	.....	.....	\$813,803.47

*About one-quarter of these are occupied.

COSTS REDUCED TO A LAMP BASIS.

Reducing the above investment, exclusive of the Belle Isle, to the amount per lamp on the basis of the electrical capacity of the plant, viz: 2,375 arc of 2,000 candle power, and 3,500 incandescent of 16 candle power, and we have the following:

	Arc.	Incandescent.
Conduits, occupied	\$ 8.34	.58
Cables	14.19	.99
Real estate	24.09	1.69
Buildings and wharf.	41.98	2.94
Lines and poles	51.90	3.64
Towers and lamp posts.	41.03	....
Arc plant	25.63	....
Incandescent plant . . . . .	....	3.85
Steam plant	42.68	2.99
Railway track and scales.	4.17	.29
Machine shop	3.10	.21
Arc lamps and switches.	22.77	....
 Total	 \$279.88	 \$17.18

EXPENDITURES FOR INVESTMENT ACCOUNT.

The amount expended for investment accounts during the periods specified were as follows:

	Prior to June 30, 1897.	Year ending June 30, '98.	Year ending June 30, '99.	Total Investment.
Conduits	\$ 72,870.69	\$ 11,127.35	\$ 2,560.16	\$ 86,558.20
Cables	31,182.19	4,740.78	1,264.07	37,187.04
Real estate	63,125.00	.....	.....	63,125.00
Buildings and wharf..	109,098.61	846.99	58.90	110,004.50
Lines and poles.....	121,296.14	8,802.76	5,964.58	136,063.48
Towers and lamp posts	95,755.02	1,279.13	402.80	97,436.95
Arc plant	52,480.81	6,002.84	2,402.08	60,885.73
Incandescent plant	11,220.80	2,183.23	.....	13,404.03
Steam plant	101,789.24	6,450.37	3,607.86	111,847.47
Railway track and scales	9,935.60	1,046.71	.....	10,982.31
Machine shop	5,691.31	2,175.40	147.45	8,014.16
Arc lamps and switches	46,955.47	5,241.29	1,869.83	54,066.59
Belle Isle plant.....	7,821.85	11,026.15	5,380.01	24,228.01
 Totals	 \$729,222.73	 \$ 60,923.00	 \$ 23,657.74	 \$813,803.47

ARRANGEMENT OF LAMPS.

The lighting of the city is done exclusively by means of arc lamps of 2,000 C. P. The 1,911 arc lamps now operated are distributed in 1,533 locations. The lights are placed on towers, posts or center suspension, as the conditions demand. They are as follows:

	947 lamps.
947 cranes,	947 lamps.
160 center suspensions,	160 "
122 posts, single lamps,	122 "
5 posts, double lamps,	10 "
140 mast arms,	140 "
2 pole tops,	2 "
17 indoor work,	17 "
51 three-light towers,	153 "
87 four-light towers,	348 "
2 six-light towers,	12 "
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1,533 locations,	1,911 "

HOURS OF LIGHTING.

Month.	Total Hrs. Operated.	Av'ge Hrs. Operated.
July	229:30	7:24
August	267:05	8:37
September	306:10	10:12
October	360:10	11:36
November	391:10	13:02
December	421:20	13:36
January	412:30	13:18
February	343:55	12:17
March	336:20	10:51
April	275:50	9:07
May	245:25	7:55
June	220:40	7:07
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	3,810:05	10:25

DISTRIBUTION OF LAMPS BY WARDS.

The lamps distributed by Wards, with comparative size and assessed value of the Wards of the City, are as follows:

Ward	Acreage.	Total Assessed value, 1898.	Lamps.
1.....	1,072.39	\$40,719,360	183
3.....	736.23	8,133,660	100
5.....	636.36	7,669,420	89
7.....	666.48	7,096,360	110
9.....	875.73	8,106,260	97
11.....	646.14	6,609,460	96
13.....	1,070.61	6,529,190	94
15.....	1,151.54	6,577,510	*125
17.....	2,560.00	8,017,950	96
 Total East Side.....	 9,415.48	 \$99,459,170	 990
 2.....	 836.96	 \$57,865,600	 179
4.....	937.44	14,786,950	120
6.....	780.58	9,553,630	115
8.....	991.79	8,468,910	113
10.....	979.68	7,672,890	111
12.....	990.79	6,460,610	95
14.....	1,175.36	7,736,720	99
16.....	1,456.59	4,966,520	89
 Total West Side.....	 8,149.19	 \$117,511,830	 921
 Grand Total.....	 17,564.67	 \$216,971,000	 1,911

*Of these 39 are on Belle Isle Park.

PUBLIC BUILDINGS LIGHTED.

The public buildings lighted by incandescent lights and the number of 16 candle-power lamps in each are as follows:

Public Lighting Station and Offices.....	398
City Hall and County Offices.....	922
Public Library	922
Municipal Court Building.....	286
Board of Health Offices.....	53
Water Board Offices.....	132
Police Headquarters, Central Station.....	201
Police Headquarters, East Side.....	100
Woodbridge Street Police Station.....	28
Police Barns	86
Fire Department Headquarters, Engine House No. 1.....	144
Fire Department, Telegraph Station.....	81
Engine House No. 2.....	24
Engine House No. 3.....	33
Engine House No. 6.....	46
Engine House No. 8.....	52
Engine House No. 9.....	23
Engine House No. 11.....	18
Hook and Ladder House No. 2.....	16
Chemical Engine House No. 2.....	16
Board of Education Offices.....	174
Washington Normal School.....	71
Everett Night School.....	85
Capitol Square Fountain.....	23
U. S. S. Yantic.....	43
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	3,977

Belle Isle Park—

Bath House	96
Bicycle Shelter	138
Boat House	18
Boat Club	172
Casino	235
Dock	54
Park Barn	50
Police Station	46
Skating Pavilion	99
Miscellaneous	32
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Total Belle Isle Park.....	934
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Total lamps	4,911

LAMPS AND LAMP HOURS OPERATED.

The average number of lamps operated each month, with the total lamp hours scheduled and the lamp hours out during that time, are as follows:

Twelve Months to June 30, 1899.

	Average Number Lamps.	Total Lamp Hours Scheduled.	Total Lamp Hours Out Hrs. Min.
July	1,828	408,595	87:45
August	1,831	478,657	82:48
September	1,820	544,686	247:21
October	1,818	641,515	361:21
November	1,872	719,755	511:00
December	1,878	771,057	2,426:11
January	1,880	761,798	285:17
February	1,881	634,573	183:17
March	1,882	622,061	171:09
April	1,896	510,572	203:52
May	1,915	457,511	241:30
June	1,918	410,670	228:12
Totals	1,868	6,961,450	5,029:43

The corresponding for the 12 months ending June 30, 1897, is as follows:

Twelve Months to June 30, 1898.

July	1,603	370,714	54:28
August	1,603	420,804	422:57
September	1,605	477,413	42:07
October	1,631	582,105	118:29
November	1,766	677,995	34:22
December	1,806	750,115	70:02
January	1,813	722,746	1,117:58
February	1,815	606,948	293:02
March	1,816	593,525	653:16
April	1,818	492,334	*4,292:31
May	1,823	433,297	195:59
June	1,826	377,356	170:12
Totals	1,744	6,505,352	7,465:23
For year ending June 30, 1897	1,564	5,873,300	1,371:07

*Caused by Trimmers' strike.

CAUSES OF LAMP HOURS OUT.

The causes of "Lamp Hours Out" for the year are summarized as follows:

Month.	Line Trouble. La'ps.	Lamp Trouble. Hrs. M.	Trimmers Neglect La'ps.	Hrs. M.	Total. La'ps. Hrs. M.
July,	...	....	9	42:45	10 45:00 19 87:45
Aug.,	2	15:55	11	47:22	5 29:31 18 92:48
Sept.,	..	....	19	116:20	24 131:01 43 247:21
Oct.,	18	68:01	21	109:26	34 183:54 73 361:21
Nov.,	...	....	39	253:35	39 257:25 78 511:00
Dec.,	258	2,073:08	26	195:43	33 157:20 317 2,426:11
Jan.,	4	49:46	23	144:35	15 90:56 42 285:17
Feb.,	34	66:07	11	76:25	7 40:45 52 183:17
Mar.,	13	59:29	4	30:41	15 80:59 32 171:09
Apr.,	49	71:17	10	51:17	13 81:18 72 203:52
May,	57	151:21	9	42:48	12 47:21 78 241:30
June,	52	90:08	18	85:55	15 52:09 85 228:12
Total,	487	2,645:12	200	1,196:52	222 1,197:39 909 5,039:43
1898,	1,479	5,606:13	129	772:01	214 1,087:09 1,822 7,465:23
1897,	108	403:02	56	358:15	88 609:10 242 1,371:07

This large "Outage" for December was caused by the heavy snow storm of December 4th, which brought down the lines of the telephone companies upon this Commission's lines, thus putting out the entire west side of the city for part of one night.

TRIMMING ARC LAMPS.

The work of trimming the lamps is intrusted to the care of a chief trimmer with 16 men. The single carbon Adams-Bagnall lamps are located in the underground or business district and are trimmed daily. The Brush double carbon lamps are located in the residence districts and are trimmed every second day, each trimmer having two circuits to care for.

Number of Trimmer.	Number of Route.	Towers.	Lamps Trimmed on			Total Lamps.	Length of Route in Miles.
			Poles.	Cent. Susp.			
1	1	34	53	1	88	4.3	
2	2	44	43	1	88	4.5	
3	3	24	34	7	65	4.8	
3	5	3	51	12	66	4.7	
4	4	4	43	19	66	4.8	
4	6	21	18	22	61	5.7	
5	7	14	41	5	60	6.4	
5	9	31	23	7	61	6.1	
6	8	8	40	18	66	5.8	
6	10	12	26	25	63	5.3	
7	11	7	46	3	56	10.8	
7	13	13	44	..	57	7.6	
8	12	14	34	13	61	6.	
8	14	17	35	4	56	6.9	
9	15	7	47	15	69	5.5	
9	17	12	34	19	65	6.8	
10	16	19	25	18	62	6.4	
10	18	16	33	11	60	6.3	
11	19	7	43	13	63	6.2	
11	21	4	37	18	59	7.	
12	20	13	34	13	60	7.	
12	22	29	25	2	56	7.1	
13	23	19	25	14	58	7.	
13	25	..	51	4	55	9.	
14	24	15	35	7	57	7.1	
14	26	18	33	4	55	7.5	
15	27	9	47	1	57	7.6	
15	29	10	45	1	56	10.1	
16	28	22	31	5	58	7.5	
16	30	23	32	1	56	7.8	
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Totals...	30	469	1,108	283	1,860	199.6	
Average.	15	36	9	62		6.65	
Belle Isle	8	31		39			
Inclosed lamps				12			
Series incandescent lamps, equivalents in arc lamps..				8			
Grand total arc lamps.....				1,919			

COMPARATIVE KILOWATT HOUR OUTPUT.

Twelve Months to June 30, 1899.

Month.	Arc.	Incan.	Total.
July	187,949	24,170	212,119
August	220,195	26,460	246,655
September	250,570	27,066	277,636
October	295,194	30,232	325,426
November	327,486	32,008	359,494
December	350,848	35,574	386,422
January	346,715	35,440	382,155
February	288,681	30,650	319,331
March	282,998	32,508	315,506
April	232,305	26,750	259,055
May	210,445	29,670	240,115
June	188,907	26,746	215,653
Totals	3,182,293	357,274	3,539,567

Twelve Months to June 30, 1898.

Month.	Arc.	Incan.	Total.
July	170,527	17,004	187,531
August	193,563	17,934	211,497
September	220,566	21,589	242,155
October	268,682	25,342	294,024
November	308,487	29,179	337,666
December	341,300	32,332	373,632
January	328,867	32,340	361,207
February	276,152	28,426	304,578
March	270,048	29,042	299,090
April	224,014	25,318	249,332
May	199,233	24,596	223,829
June	173,580	23,494	197,074
Totals	2,975,019	306,596	3,281,615
Year ending June 30, 1897.....	2,716,628	263,784	2,980,412
Year ending June 30, 1896.....	2,407,232	220,653	2,627,885

COMPARATIVE AMOUNTS OF COAL CONSUMED.

The total amount of coal consumed during the year and the same reduced to the number of pounds per kilowatt hour with comparisons is as follows:

	Year ending June 30, '99. Lbs. of Coal Consumed.	Lbs. per Kw. Hr.	Year to June 30, '98. Lbs. per Kw. Hr.	Year to June 30, '97. Lbs. per Kw. Hr.	Year to June 30, '96. Lbs. per Kw. Hr.
July	1,227,780	5.79	5.53	5.32	6.85
August	1,368,820	5.55	5.40	5.03	6.10
October	1,696,420	5.21	5.07	4.89	4.58
September	1,471,220	5.30	4.72	5.10	5.90
November	1,709,500	4.75	4.96	4.87	4.53
December	1,804,180	4.64	4.76	4.82	4.67
January	1,815,310	4.75	5.42	4.56	4.60
February	1,564,080	4.90	5.10	4.52	4.70
March	1,630,730	5.17	5.27	5.10	4.85
April	1,401,710	5.41	5.24	5.24	5.10
May	1,272,330	5.30	5.57	5.49	5.27
June	1,204,350	5.58	5.76	5.80	5.28
Totals	18,166,430	5.19	5.23	4.99	4.95

Year to June 30,

1898 17,075,525

Year to June 30,

1897 15,032,230

Year to June 20,

1896 13,114,531

COST OF COAL.

The prices paid for coal, delivered on Public Lighting Commission side track, weights guaranteed, were:

Year ending June 30, 1896—Jackson Hill Lump.....	\$ 2.19
" " 30, 1897— " "	2.12
" " 30, 1898— " "	1.97
" " 30, 1899— " "	1.97

INSIDE WIRING INSPECTION DEPARTMENT.

The work of the department having in charge the inspection of inside electrical wiring and apparatus for the year ending June 30th, 1899, was as follows:

Month of	Number of Applications for and Permits Issued.	Number of Approvals and Certificates Issued.	Amount of Fees Collected.	Expenses.
July	211	209	\$257.25	\$209.50
August	187	206	244.50	179.48
September	231	215	228.00	161.32
October	290	287	289.75	161.32
November	243	241	200.75	162.82
December	172	176	164.75	249.14
January	136	139	147.75	159.32
February	191	192	186.50	159.97
March	242	225	198.75	162.82
April	190	170	167.00	173.57
May	261	241	249.00	201.27
June	256	276	244.25	232.82
Totals	2,610	2,577	\$2,578.25	\$2,213.35

Twelve Months to June 30, 1898.

July	199	157	\$172.75	\$247.75
August	174	203	253.50	247.75
September	279	234	228.75	235.97
October	281	249	197.00	228.30
November	249	246	264.75	238.25
December	225	278	279.25	234.20
January	211	206	206.50	228.50
February	197	217	231.25	224.00
March	252	291	294.00	221.75
April	242	229	178.75	236.00
May	218	227	240.00	231.50
June	233	243	224.50	252.00
Totals	2,760	2,780	\$2,771.00	\$2,825.97

EMPLOYES AND COMPENSATION.

The employes of the Public Lighting Commission on June 30th, 1899,
were:

Executive:

	Rate per year.	Rate per day and 7 days per week.	Rate per day and 6 days per week.
1 Secretary	\$1,800.00	....	....
1 City electrician	2,000.00	....	....
1 Outside superintendent	1,100.00	....	....
1 Assistant secretary	900.00
1 Storekeeper	600.00
1 Superintendent's clerk	480.00
1 Janitor	\$1.60

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Inspection Department:

1 Inspector	\$1,000.00
1 Permit clerk	900.00

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Station Department:

1 Chief Engineer	1,500.00
2 First engineers, each.....	\$3.00
3 Second engineers, each.....	2.00
6 Firemen, each .....	....	1.75	....
1 Coal Passer .....	....	1.75	....
1 Handy man	720.00	....	....
6 Oilers, each .....	....	1.50	....
1 Chief electrician	1,000.00	....	....
2 Assistant electricians, each...	2.50
3 Switchboard tenders, each...	1.00
6 Laborers	1.50

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Lighting:

1 Head trimmer	\$ 900.00
16 Trimmers	\$2.00
2 Patrolmen, with horses, each.	3.00
1 Belle Isle man.....	780.00
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Maintenance and Extension:

1 Machinist	\$2.85
*1 Machinist's helper	2.00
1 Blacksmith	2.50
1 Carpenter .....	....	....	2.00
1 Latheman .....	....	....	2.50
1 Painter .....	....	....	2.00
*1 Cable and lamp expert.....	....	....	3.25
1 Helper to same.....	....	....	1.50
1 Dynamo and lamp repairer...	....	....	2.50
1 Helper to same.....	....	....	2.00
1 Wireman .....	....	....	2.50
1 Helper .....	....	....	2.00
1 Conduitman .....	....	....	1.75
1 Conduitman, helper .....	....	....	1.50
1 Chief Inspector of lines.....	1,000.00	....	....
1 Repair foreman-of lines, etc..	....	....	3.25
1 Regular lineman.....	....	....	2.25
1 Regular lineman .....	....	....	2.50
4 Helpers, each	2.00
2 Helpers, each	1.50
1 Apprentice in lamp room.....	1.00
*1 Steamfitter	2.75
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*Temporary employes.

Total employes, 87.

One day's work consists of 8 hours, proportionate wages for overtime.

Employes paid by the yearly rate subject to call at any time night or day, without extra compensation.

COMPARATIVE CASH COST OF AN ARC LIGHT.

The year's operating expenses can be divided between the Arc and the Incandescent in proportion to the electrical output. That chargeable to Arc Lighting would be \$26,799.34, which amount reduced to the cost of an arc lamp for one year shows the following relative figures:

Department.	Wages.	Stores	Total.
Maintenance	\$ 5.87	\$ 2.50	\$ 8.37
Executive	3.56	.37	3.93
Station	10.32	9.51	19.83
Trimming	10.20	3.91	14.11
Shop .....	....	.05	.05
Injuries and damages.....	.03	.14	.17
Totals	\$29.98	\$16.48	\$46.46

The corresponding figures for the twelve months ending June 30, 1898, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 6.14	\$ 2.34	\$ 8.48
Executive	3.98	.43	4.41
Station	11.44	10.44	21.88
Trimming	11.45	5.09	16.54
Shop .....	.26	.11	.37
Injuries and damages.....	....	.17	.17
Totals	\$33.27	\$18.58	\$51.85

The corresponding figures for the twelve months ending June 30, 1897, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 9.71	\$ 2.87	\$12.58
Executive	5.18	.62	5.80
Station	12.16	11.61	23.77
Trimming	13.86	5.03	18.89
Shop	2.65	.38	3.03
Injuries and damages.....	.01	.11	.12
Totals	\$43.57	\$20.62	\$64.19

COMPARISON OF OPERATING DISBURSEMENTS.

The operating disbursements for the year ending June 30, 1899, in the various departments, if partitioned between wages and stores, will show the following division on the basis of each \$100.00 expended:

Department.	Wages.	Stores.	Total.
Maintenance	\$12.57	\$ 5.44	\$ 18.01
Executive	7.65	.81	8.46
Station	22.21	20.46	42.67
Trimming	21.95	8.41	30.36
Shop .....	....	.12	.12
Injuries and Damages.....	.06	.32	.38
Totals	\$64.44	\$35.56	\$100.00

The corresponding figures for the twelve months ending June 30, 1898, are:

Department.	Wages.	Stores.	Total.
Maintenance	\$11.84	\$ 4.51	\$ 16.35
Executive	7.67	.83	8.50
Station	22.07	20.14	42.21
Trimming	22.07	9.83	31.90
Shop .....	.51	.20	.71
Injuries and damages.....	....	.33	.33
Total	\$64.16	\$35.84	\$100.00

The corresponding figures for the twelve months ending June 30, 1897, are:

Department.	Wages.	Stores.	Total.
Maintenance	\$15.13	\$ 4.45	\$ 19.58
Executive	8.06	.96	9.02
Station	18.95	18.09	37.04
Trimming	21.61	7.83	29.44
Shop	4.13	.60	4.73
Injuries and damages.....	.01	.18	.19
Total	\$67.89	\$32.11	\$100.00

COST OF OPERATING FOR MONTH OF JULY, 1898.

Output, 212,119 K. W. Hours.

(July, '97, output, 187,531 K. W. Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 101.05	\$ 137.93	\$ 238.98	....
Steam plant	96.55	1.63	98.18	....
Electric plant	198.36	23.91	222.27	....
Misc. tools and machinery...	44.50	28.02	72.52	....
Conduits	39.42	18.58	58.00	....
Towers and lampposts.....	47.00	0.45	47.45	....
Arc lamps	202.09	94.16	296.25	....
Lines and cables.....	288.72	277.22	565.94	....
 Total maintenance.....	 \$1,017.69	 \$ 581.90	 \$1,599.59	 .00754
Executive:				
Salary Sec'y and City Elect..	\$ 316.66	....	\$ 316.66	....
Printing and stationery .....	....	5.09	5.09	....
Storeroom	68.65	....	68.65	....
Clerks and office expense....	124.00	7.00	131.00	....
Civil eng. and draughting...	131.66	....	131.66	....
 Total executive	 \$ 640.97	 \$ 12.00	 \$ 653.06	 .00308
Station:				
Oils	\$	\$ 77.70	\$ 77.70	.00037
Waste .....	....	20.60	20.60	.00009
Coal .....	....	1,238.29	1,238.29	.00584
Miscellaneous .....	....	69.37	69.37	.00033
Wages	1,834.96	....	1,834.96	.00865
 Total station	 \$1,834.96	 \$1,405.96	 \$3,240.92	 .01528
Lighting:				
Trimming arcs	\$1,563.00	\$	\$1,563.00	....
Carbons .....	....	452.19	452.19	....
Incand. lamp renewals.....	....	45.66	45.66	....
Incand. lighting expense....	7.03	2.08	9.11	....
Globes and nets.....	....	45.24	45.24	....
Miscellaneous .....	....	7.19	7.19	....
Belle Isle plant.....	109.85	0.22	110.07	....
 Total lighting	 \$1,679.88	 \$ 552.58	 \$2,232.46	 .01053
Shop supplies .....	....	\$ 13.86	\$ 13.86	.00006
Injuries and damages.....	....	....	....	....
 Total lighting expense....	 \$5,173.50	 \$2,566.39	 \$7,739.89	 .03689
July, 1897, was.....	\$5,952.55	\$2,525.20	\$8,477.75	.04522

COST OF OPERATING FOR MONTH OF AUGUST, 1898.

Output, 246,655 K. W. Hours.

(August, '97, output, 211,497 K. W. Hours.)

	Wages.	Stores.	Total.	per K.W. Hour.	Cost
Maintenance:					
Bldgs., dock, etc.....	\$ 206.82	\$ 66.56	\$ 273.38	....
Steam plant	85.69	5.76	91.45	....
Electric plant	84.07	97.49	181.56	....
Misc. tools and machinery..	55.83	124.18	180.01	....
Conduits	50.63	0.47	51.10	....
Towers and lampposts.....	3.31	....	3.31	....
Arc lamps	149.22	138.80	288.02	....
Lines and cables.....	306.18	67.82	374.00	....
Total maintenance	\$ 941.75	\$ 501.08	\$1,442.83	.00585	
Executive:					
Salary Sec'y and City Elect..	\$ 316.66	....	316.66	....
Printing and stationery.....	....	241.09	241.09	....
Storeroom	68.00	....	68.00	....
Office expenses	126.00	3.91	129.91	....
Engineering and draughting.	131.66	3.86	135.52	....
Total executive	\$ 642.32	\$ 248.86	\$ 891.18	.00361	
Station:					
Oils	\$	\$ 92.24	\$ 92.24	.00037	
Waste .....	....	19.50	19.50	.00008	
Coal .....	....	1,348.29	1,348.29	.00547	
Miscellaneous .....	....	50.01	50.01	.00020	
Wages	1,876.92	....	1,876.92	.00761	
Total station	\$1,876.92	\$1,510.04	\$3,386.96	.01373	
Lighting:					
Wages (trimmers)	\$1,563.00	\$	\$1,563.00	....
Carbons .....	....	457.88	457.88	....
Renewals, incand. .....	....	44.11	44.11	....
Incand. expense	14.93	0.40	15.33	....
Globes and nets.....	....	41.56	41.56	....
Miscellaneous .....	....	23.54	23.54	....
Total lighting	\$1,577.93	\$ 567.49	\$2,145.42	.00870	
Belle Isle expense.....	\$ 184.55	\$ 42.32	\$ 226.87	.00092	
Shop .....	....	15.63	15.63	.00006	
Injuries and damages.....	....	....	....	....
Total operating expense...\$5,223.47		\$2,885.42	\$8,108.89	.03287	
August, 1897, was.....\$5,350.85		\$2,661.68	\$8,012.53	.03784	

COST OF OPERATING FOR MONTH OF SEPTEMBER, 1898.

Output, 277,636 K. W. Hours.

(September, '97, output, 242,155 K. W. Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 74.85	\$ 41.85	\$ 116.70	.....
Steam plant	62.58	97.15	159.73	.....
Electric plant	114.96	45.01	159.97	.....
Misc. tools and machinery...	84.99	28.81	113.80	.....
Conduits	41.79	0.40	42.19	.....
Towers and lampposts.....	59.81	2.00	61.81	.....
Arc lamps	387.90	132.01	519.91	.....
Lines and cables.....	243.92	88.64	332.56	.....
 Total maintenance	\$1,070.80	\$ 435.87	\$1,506.67	.00543
Executive:				
Salary Sec'y and City Elect..	\$ 316.66	\$	\$ 316.66	.....
Printing and stationery.....	....	69.43	69.43	.....
Storeroom	65.00	....	65.00	.....
Office expenses	126.75	6.93	133.68	.....
Engineering and draughting.	91.66	....	91.66	.....
 Total executive	\$ 600.07	\$ 76.36	\$ 676.43	.00244
Station:				
Oils	\$	\$ 87.23	\$ 87.23	.00032
Waste .....	....	18.85	18.85	.00007
Coal .....	....	1,449.15	1,449.15	.00522
Miscellaneous .....	....	81.68	81.68	.00029
Wages	1,799.71	....	1,799.71	.00648
 Total station	\$1,799.71	\$1,636.91	\$3,436.62	.01238
Lighting:				
Trimming arcs	\$1,515.00	\$	\$1,515.00	.....
Carbons .....	....	493.84	493.84	.....
Inc. lamp renewals.....	....	62.53	62.53	.....
Incand. lighting expense....	15.01	11.00	26.01	.....
Globes and nets.....	....	48.24	48.24	.....
Miscellaneous	4.25	3.49	7.74	.....
Belle Isle Park.....	84.52	....	84.52	.....
 Total lighting	\$1,618.78	\$ 619.10	\$2,237.88	.00806
Shop supplies	\$	\$ 6.94	\$ 6.94	.00002
Injuries and damages.....	....	....	....	....
 Total operating expense...	\$5,089.36	\$2,775.18	\$7,864.54	.02833
September, 1897, was.....	\$5,363.06	\$3,012.72	\$8,375.78	.03459

COST OF OPERATING FOR MONTH OF OCTOBER, 1898.

Output, 325,426 K. W. Hours.

(October, '97, output, 294,024 K. W. Hours.)

	Wages.	Stores..	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 55.86	\$ 9.13	\$ 64.99	....
Steam plant	136.23	150.35	286.58	....
Electric plant	52.21	24.44	76.65	....
Misc. tools and machinery...	48.71	15.43	64.14	....
Conduits	67.00	....	67.00	....
Towers and lampposts.....	180.36	5.77	186.13	....
Arc lamps	594.53	277.65	872.18	....
Lines and cables.....	213.11	49.82	262.93	....
 Total maintenance	\$1,348.01	\$ 532.59	\$1,880.60	.00578
Executive:				
Salary Sec'y and City Elect..	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	41.85	41.85	....
Storeroom expenses	66.00	1.60	67.60	....
Office expenses	126.00	12.29	138.29	....
Civil eng. and draughting....	91.66	0.48	92.14	....
 Total executive	\$ 600.32	\$ 56.22	\$ 656.54	.00202
Station:				
Oils	\$	\$ 97.54	\$ 97.54	.00030
Waste .....	....	19.89	19.89	.00006
Coal .....	....	1,670.97	1,670.97	.00513
Miscellaneous .....	....	61.36	61.36	.00019
Wages	1,890.68	....	1,890.68	.00581
 Total station	\$1,890.68	\$1,849.76	\$3,740.44	.01149
Lighting:				
Trimming arc lamps.....	\$1,563.00	\$	\$1,563.00	....
Carbons used .....	....	607.99	607.99	....
Incand. renewals .....	....	46.58	46.58	....
Incand. lighting expense....	5.14	....	5.14	....
Globes and nets.....	....	53.83	53.83	....
Miscellaneous	1.75	16.93	18.68	....
Belle Isle Park.....	127.97	15.53	143.50	....
 Total lighting	\$1,697.86	\$ 740.86	\$2,438.72	.00749
Shop supplies	\$	\$ 28.97	\$ 28.97	.00009
Injuries and damages.....	....	36.00	36.00	.00011
 Total operating cost.....	\$5,536.87	\$3,244.40	\$8,781.27	.02698
October, 1897, was.....	\$5,208.99	\$3,091.68	\$8,300.67	.02824

COST OF OPERATING FOR MONTH OF NOVEMBER, 1898.

Output, 359,494 K. W. Hours.

(Nov., '97, output, 337,666 K. W. Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 63.61	\$ 31.32	\$ 94.93	....
Steam plant	73.96	96.75	170.71	....
Electric plant	99.84	1.28	101.12	....
Misc. tools and machinery..	74.14	6.99	81.13	....
Conduits	31.50	25.24	56.74	....
Towers and lampposts.....	138.72	1.49	140.21	....
Arc lamps	498.82	82.93	581.75	....
Lines and cables.....	205.58	46.19	251.77	....
 Total maintenance	\$1,186.17	\$ 292.19	\$1,478.36	.00411
Executive:				
Sal'y Sec'y and City Elect..	\$ 316.66	\$	\$ 316.66	....
*Printing and stationery.....	....	10.56	10.56	....
Storeroom	68.97	0.25	69.22	....
Clerks and office expense....	134.65	3.19	137.84	....
Engineering and draughting.	91.66	2.40	94.06	....
 Total executive	\$ 611.94	\$ 16.40	\$ 628.34	.00175
Station:				
Oils	\$	\$ 82.45	\$ 82.45	.00023
Waste .....	....	20.24	20.24	.00006
Coal .....	....	1,683.86	1,683.86	.00468
Miscellaneous .....	....	175.75	175.75	.00049
Wages	1,752.59	....	1,752.59	.00488
 Total station	\$1,752.59	\$1,962.30	\$3,714.89	.01034
Lighting:				
Trimming and patrolling....	\$ 1,850.82	\$ 10.00	\$ 1,860.82	....
Carbons .....	....	701.57	701.57	....
Incand. lamp renewals.....	....	95.18	95.18	....
Incand. lighting expense....	17.12	1.89	19.01	....
Globes and nets.....	....	60.69	60.69	....
Miscellaneous .....	....	13.24	13.24	....
Belle Isle Park.....	84.91	3.77	88.68	....
 Total lighting	\$1,952.85	\$ 886.34	\$2,839.19	.00789
Shop supplies	\$	\$ 1.11	\$ 1.11	....
Injuries and damages.....	....	165.10	165.10	.00046
 Total operating expense....	\$5,503.55	\$3,323.44	\$8,826.99	.02455
November, 1897, was.....	\$5,125.03	\$3,265.06	\$8,390.09	.02490

COST OF OPERATING FOR DECEMBER, 1898.

Output, 386,422 K. W. Hours.

(December, '97, output, 373,632 K. W. Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 70.80	\$ 2.80	\$ 73.60	.....
Steam plant	105.19	140.19	245.38	.....
Electric plant	72.70	1.96	74.66	.....
Misc. tools and machinery..	81.02	3.12	84.14	.....
Conduits	39.62	1.33	40.95	.....
Towers and lampposts.....	53.85	....	53.85	.....
Arc lamps	452.80	66.44	519.24	.....
Lines and cables.....	362.03	89.96	451.99	.....
 Total maintenance.....	 \$1,238.01	 \$ 305.80	 \$1,543.81	 .00399
Executive:				
Sal'y Sec'y and City Elect...\$	316.66	\$	\$ 316.66	.....
Printing and stationery .....	....	20.00	20.00	....
Storeroom	75.42	....	75.42	.....
Office expenses	130.25	3.30	133.55	.....
Engineer. and draughting...	91.66	....	91.66	.....
 Total executive	 \$ 613.99	 \$ 23.30	 \$ 637.29	 .00165
Station:				
Oils	\$	\$ 96.15	\$ 96.15	.00025
Waste .....	....	20.38	20.38	.00005
Coal .....	....	1,777.13	1,777.13	.00459
Miscellaneous .....	....	43.57	43.57	.00011
Wages	1,850.41	....	1,850.41	.00480
 Total station	 \$1,850.41	 \$1,937.23	 \$3,787.64	 .00980
Lighting:				
Trimming and patrolling....\$	1,929.51	\$ 13.00	\$1,942.51	.....
Carbons .....	....	738.10	738.10	.....
Incand. renewals .....	....	100.60	100.60	.....
Incand. light expense.....	12.95	0.60	13.55	.....
Globes and nets.....	....	28.80	28.80	.....
Miscellaneous .....	....	38.41	38.41	.....
Belle Isle operating expense.	76.75	9.37	86.12	.....
 Total lighting	 \$2,019.21	 \$ 928.88	 \$2,948.09	 .00763
Shop supplies	\$	\$ 0.47	\$ 0.47	....
Injuries and damages.....	62.00	....	62.00	.00016
 Total operating expenses..	 \$5,783.62	 \$3,195.68	 \$8,979.30	 .02323
December, 1897, was.....	\$5,339.33	\$3,398.78	\$8,738.11	.02338

COST OF OPERATING FOR JANUARY, 1899.

Output, this month, 382,155 K. W. Hours.

(Output, January, '98, 361,207 K. W. Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 43.07	\$ 6.67	\$ 49.74	....
Steam plant	111.62	110.62	222.24	....
Electric plant	122.43	3.07	125.50	....
Misc. tools and machinery..	59.55	31.54	91.09	....
Conduits	37.50	....	37.50	....
Towers and lampposts.....	31.89	....	31.89	....
Arc lamps	373.98	143.75	517.73	....
Lines and cables.....	378.40	167.97	546.37	....
 Total maintenance	\$1,158.44	\$ 463.62	\$1,622.06	.00425
Executive:				
Sal'y Sec'y and City Elect..	\$ 316.66	....	316.66	....
Printing and stationery.....	....	36.58	36.58	....
Storeroom	78.96	....	78.96	....
Office expenses	125.00	2.85	127.85	....
Civil eng. and draughting...	91.66	3.00	94.66	....
 Total executive	\$ 612.28	\$ 42.43	\$ 654.71	.00171
Station:				
Oils	\$	\$ 83.63	\$ 83.63	.00022
Waste .....	....	18.13	18.13	.00005
Coal .....	....	1,788.08	1,788.08	.00467
Miscellaneous .....	....	37.30	37.30	.00010
Wages	1,819.29	....	1,819.29	.00476
 Total station	\$1,819.29	\$1,927.14	\$3,746.43	.00980
Lighting:				
Trimming and patrolling....	\$1,939.17	\$ 10.00	\$1,949.17	....
Carbons .....	....	597.06	597.06	....
Incand. renewals .....	....	93.18	93.18	....
Incand. light expense.....	13.85	20.16	34.01	....
Globes and nets.....	....	39.05	39.05	....
Miscellaneous expense .....	....	9.98	9.98	....
Belle Isle Park.....	81.38	1.60	82.98	....
 Total lighting	\$2,034.40	\$ 771.03	\$2,805.43	.00734
Surgeon and hospital.....	....	....	....	....
Shop supplies .....	....	\$ 22.08	\$ 22.08	.00006
 Total operating expense...	\$5,624.41	\$3,226.30	\$8,850.71	.02316
January, 1898, was.....	\$5,462.29	\$3,634.15	\$9,096.44	.02517

FOURTH ANNUAL REPORT

COST OF OPERATING FOR FEBRUARY, 1899.

Output, this month, 319,331 K. W. Hours.

(Output February, 1898, 304,578 K. W. Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 53.84	\$ 13.37	\$ 67.21	....
Steam plant	83.41	136.60	220.01	....
Electric plant	113.16	....	113.16	....
Miscel. tools and mach'y.....	34.88	....	34.88	....
Conduits	34.50	....	34.50	....
Towers and lamp posts.....	18.97	....	18.97	....
Arc lamps	340.74	104.00	444.74	....
Lines and cables.....	417.15	117.00	534.15	....
 Total maintenance	\$1,096.65	\$ 370.97	\$1,467.62	.00460
Executive:				
Sal'y Sec'y and City Elect...\$	316.66	\$	\$ 316.66	....
Printing and stationery.....	....	21.87	21.87	....
Store room expense.....	63.00	....	63.00	....
Office expense	123.00	15.28	138.28	....
Engineering and draughting..	91.66	.50	92.16	....
 Total executive expense...\$	594.32	\$ 37.65	\$ 631.97	.00198
Station:				
Oils	\$	\$ 72.41	\$ 72.41	.00023
Waste .....	....	25.22	25.22	.00008
Coal .....	....	1,540.62	1,540.62	.00482
Miscellaneous .....	....	35.23	35.23	.00011
Wages	1,657.52	....	1,657.52	.00519
 Total station expense.....\$	1,657.52	\$1,673.48	\$3,331.00	.01043
Lighting:				
Trimming and patrolling....\$	1,758.12	\$ 12.44	\$1,770.56	....
Carbons .....	....	431.11	431.11	....
Incand. renewals .....	....	98.73	98.73	....
Incand. expense	65.20	3.50	68.70	....
Globes and nets.....	....	29.37	29.37	....
Miscellaneous .....	....	9.26	9.26	....
Belle Isle operating.....	77.50	4.00	81.50	....
 Total lighting expense....\$	1,900.82	\$ 588.41	\$2,489.23	.00780
Shop supplies	\$	\$ 6.83	\$ 6.83	.00002
Injuries and damages.....	....	24.00	24.00	.00007
 Total operating expense...\$	5,249.31	\$2,701.34	\$7,950.65	.02490
February, 1898, was.....\$	5,152.92	3,166.43	8,319.35	.02731
Feb., '97 (269,880 K. W.), was.	6,122.85	2,644.71	8,767.56	.03243

COST OF OPERATING FOR MARCH, 1899.

Output, this month, 315,506 Kilowatt Hours.

(Output, March, 1898, 299,090 Kilowatt Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 48.33	\$ 9.95	\$ 58.28	....
Steam plant	134.87	254.45	389.32	....
Electric plant	155.20	27.59	182.79	....
Miscel. tools and machinery..	57.74	35.71	93.45	....
Conduits	34.50	....	34.50	....
Towers and lamp posts.....	15.58	.10	15.68	....
Arc lamps	216.12	67.15	283.27	....
Lines and cables.....	359.18	188.60	547.78	....
 Total maintenance expense.	\$1,021.52	\$ 583.55	\$1,605.07	.00506
Executive:				
Sal'y Sec'y and City Elect....	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	2.10	2.10	....
Store room	67.00	....	67.00	....
Office	140.50	11.75	152.25	....
Engineering and draughting.	91.66	4.00	95.66	....
 Total executive expense...	\$ 615.82	\$ 17.85	\$ 633.67	.00201
Station:				
Oil	\$	\$ 78.06	\$ 78.06	.00024
Waste .....	....	18.59	18.59	.00006
Coal .....	....	1,606.27	1,606.27	.00509
Miscellaneous .....	....	24.15	24.15	.00008
Wages	1,825.22	....	1,825.22	.00579
 Total station expense.....	\$1,825.22	\$1,727.07	\$3,552.29	.01126
Lighting:				
Trimming and patrolling....	\$1,936.05	\$ 10.00	\$1,946.05	....
Carbons .....	....	555.56	555.56	....
Incand. renewals .....	....	131.64	131.64	....
Incand. expense	68.09	3.40	71.49	....
Globes and nets.....	....	38.92	38.92	....
Miscellaneous supplies .....	....	12.94	12.94	....
Belle Isle operating.....	78.97	....	78.97	....
 Total lighting expense....	\$2,083.11	\$ 752.46	\$2,835.57	.00899
Shop supplies	\$	\$ 3.75	\$ 3.75	.00001
Injuries and damages.....	....	22.75	22.75	.00007
 Total lighting expense....	\$5,545.67	\$3,107.43	\$8,653.10	.02742
March, 1898, was.....	\$5,678.90	\$3,444.40	\$9,123.30	.03050
March, 1897, was.....	6,221.01	3,241.21	9,462.22	.03541

COST OF OPERATING FOR APRIL, 1899.

Output, this month, 259,055 Kilowatt Hours.

(Output, April, 1898, 249,332 Kilowatt Hours.)

	Wages.	Stores.	Total	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 23.56	\$	\$ 23.56	....
Steam plant	94.98.	140.27	235.25	....
Electric plant	28.78	3.15	31.93	....
Miscel. tools and machinery..	27.05	1.00	28.05	....
Conduits	29.00	.75	29.75	....
Towers and lamp posts.....	96.06	14.42	110.48	....
Arc lamps	146.02	61.03	207.05	....
Lines and cables.....	324.12	222.39	546.51	....
 Total maintenance expense.	 \$ 769.57	 \$ 443.01	 \$1,212.58	 .00468
Executive:				
Sal'y Sec'y and City Elect...\$	316.66	\$	\$ 316.66	....
Printing and stationery.....	....	2.62	2.62	....
Store room	67.85	....	67.85	....
Office expense	140.25	9.04	149.29	....
Engineering and draughting..	91.66	4.12	95.78	....
 Total executive expense...\$	 616.42	 \$ 15.78	 \$ 632.20	 .00244
Station:				
Oils	\$	\$ 75.35	\$ 75.35	.00029
Waste .....	....	18.07	18.07	.00007
Coal .....	....	1,380.69	1,380.69	.00533
Miscellaneous .....	....	42.27	42.27	.00016
Wages	1,733.85	....	1,733.85	.00670
 Total station expense.....\$	 1,733.85	 \$1,516.38	 \$3,250.23	 .01255
Lighting:				
Trimming and patrolling....\$	1,687.16	\$ 7.60	\$1,694.76	....
Carbons .....	....	496.07	496.07	....
Incand. lamp renewals.....	....	66.00	66.00	....
Incand. lighting expense....	13.57	....	13.57	....
Globes and nets.....	....	56.60	56.60	....
Miscellaneous .....	....	11.65	11.65	....
Belle Isle Park.....	78.25	5.80	84.05	....
 Total lighting expense....\$	 1,778.98	 \$ 643.72	 \$2,422.70	 .00935
Shop supplies	\$	\$ 5.20	\$ 5.20	....
Injuries and damages.....	....	32.25	32.25	.00014
 Total lighting expense....\$	 4,898.82	 \$2,656.34	 \$7,555.16	 .02916
April, 1898, was.....\$	5,174.66	\$2,798.64	\$7,973.30	.03198
April, 1897, was.....	6,007.51	2,662.92	8,670.43	.03928

COST OF OPERATING FOR MAY, 1899.

Output, this month, 240,115 K. W. hours; last year, 223,829 K. W.

	Wages.	Stores.	Total.	Cost per K.W. Hours.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 31.59	\$ 16.05	\$ 47.64	....
Steam plant	164.00	142.09	306.09	....
Electric plant	39.65	9.23	48.88	....
Miscel. tools and machinery..	53.07	95.05	148.12	....
Conduits	33.00	9.00	42.00	....
Towers and lamp posts.....	225.60	20.90	246.50	....
Arc lamps	76.38	31.89	108.27	....
Lines and cables.....	191.95	187.37	379.32	....
 Total maintenance	 \$ 815.24	 \$ 511.58	 \$1,326.82	 .00553
Executive:				
Sal'y Sec'y and City Elect....	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	52.97	52.97	....
Store room	68.50	.85	69.35	....
Office expenses	125.25	16.14	141.39	....
Engineering and draughting..	91.66	14.03	105.69	....
 Total executive	 \$ 602.07	 \$ 83.99	 \$ 686.06	 .00285
Station:				
Oils	\$	\$ 77.33	\$ 77.33	.00032
Waste .....	....	18.26	18.26	.00008
Coal .....	....	1,253.25	1,253.25	.00522
Miscellaneous .....	....	34.33	34.33	.00014
Wages	1,747.57	....	1,747.57	.00728
 Total station	 \$1,747.57	 \$1,383.17	 \$3,130.74	 .01304
Lighting:				
Trimming and patrolling....	\$1,256.09	\$ 13.25	\$1,269.34	....
Carbons .....	....	365.44	365.44	....
Incand. lamp renewals.....	....	71.72	71.72	....
Incand. lighting expense....	42.64	1.95	44.59	....
Globes and nets.....	....	44.04	44.04	....
Miscellaneous	1.69	49.15	50.84	....
Belle Isle Park.....	66.31	9.78	76.09	....
 Total lighting	 \$1,366.73	 \$ 555.33	 \$1,922.06	 .00801
Shop supplies	\$	\$ 1.50	\$ 1.50	....
Injuries and damages...:.....	....	18.00	18.00	.00008
 Total operating expense...	 \$4,531.61	 \$2,553.57	 \$7,085.18	 .02051
May, 1898, was.....	\$5,195.46	\$2,585.75	\$7,781.21	.03476
May, 1897, was.....	5,658.29	2,377.02	8,035.31	.04102

COST OF OPERATING, MONTH OF JUNE, 1899.

Output for the month, 215,653 K. W. Hours.

(Output, June, 1898, 197,074 K. W. Hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 10.09	\$ 20.65	\$ 30.74	....
Steam plant	63.64	158.29	221.93	....
Electric plant	36.53	2.00	38.53	....
Miscl. tools and machinery..	41.55	7.47	49.02	....
Conduits	25.25	....	25.25	....
Towers and lamp posts....	22.42	7.41	29.83	....
Arc lamps	70.39	1.83	72.22	....
Lines and cables.....	222.28	37.78	260.06	....
Total maintenance	\$ 492.15	\$ 235.43	\$ 727.58	.00338
Executive:				
Sal'y Sec'y and City Electr...	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	13.00	13.00	....
Store room	90.46	35.00	125.46	....
Office expense	140.80	102.00	242.80	....
Engineering and drafting...	91.66	1.10	92.76	....
Total executive	\$ 639.58	\$ 151.10	\$ 790.68	.00366
Station:				
Oils	\$	\$ 74.90	\$ 74.90	.00036
Waste .....	....	17.32	17.32	.00008
Coal .....	....	1,136.74	1,136.74	.00527
Miscellaneous .....	....	23.95	23.95	.00011
Wages	1,680.91	....	1,680.91	.00779
Total station	\$1,680.91	\$1,252.91	\$2,933.82	.01361
Lighting:				
Trimming and patrolling....	\$1,202.25	\$	\$1,202.25	....
Carbons .....	....	399.17	399.17	....
Incand. renewals .....	....	56.87	56.87	....
Incand. lighting expense....	21.39	3.00	24.39	....
Globes and nets.....	....	30.68	30.68	....
Miscellaneous	5.00	4.65	9.65	....
Belle Isle Park.....	67.65	10.78	78.43	....
Total lighting	\$1,296.29	\$ 505.15	\$1,801.44	.00835
Shop supplies	\$	\$ 15.83	\$ 15.83	.00007
Injuries and damages.....	....	....	....	....
Total operating expense....	\$4,108.93	\$2,160.42	\$6,269.35	.02907
Total for June, 1898.....	\$5,041.76	\$2,082.89	\$7,124.65	.03615
Total for June, 1897.....	5,592.81	2,452.40	8,045.21	.04567

CLASSIFICATION OF TOTAL OPERATING EXPENSES,

For 12 months, to June 30, 1899.

Total Kilowatt Hour Output, 3,539,567.

Account.	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, wharf, etc....\$ 783.47	\$ 356.28	\$ 1,139.75		....
Steam plant 1,212.72	1,434.15	2,646.87		....
Electric plant 1,117.89	239.13	1,357.02		....
Miscl. tools, machinery, etc.. 663.03	377.32	1,040.35		....
Conduits 463.71	55.77	519.48		....
Towers and lamp posts.... 893.57	52.54	946.11		....
Arc lamps 3,508.99	1,201.64	4,710.63		....
Lines and cables..... 3,512.62	1,540.76	5,053.38		....
 Total maintenance	\$12,156.00	\$ 5,257.59	\$17,413.59	.00492
Executive:				
Sal'y Sec'y and City Electr. \$ 3,799.92	\$	\$ 3,799.92		....
Printing and stationery....	517.16	517.16		....
Store room 847.81	37.70	885.51		....
Clerks and office expense... 1,562.45	193.68	1,756.13		....
Civil engr. and draughting.. 1,179.92	33.49	1,213.41		....
 Total executive	\$ 7,390.10	\$ 782.03	\$ 8,172.13	.00231
Station:				
Oils \$	\$ 994.99	\$ 994.99		.00028
Waste	235.05	235.05		.00007
Coal	17,873.34	17,873.34		.00505
Miscellaneous supplies	678.97	678.97		.00019
Wages 21,469.63	....	21,469.63		.00607
 Total station	\$21,469.63	\$19,782.35	\$41,251.98	.01166
Lighting:				
Trimming and patrolling...\$19,763.17	\$ 76.29	\$19,839.46		....
Carbons	6,295.98	6,295.98		....
Incand. lamp renewals.....	912.80	912.80		....
Incand. lamp expense..... 296.92	47.98	344.90		....
Globes and nets.....	517.02	517.02		....
Miscellaneous 27.87	185.25	213.12		....
Belle Isle Park..... 1,128.61	93.17	1,221.78		....
 Total lighting	\$21,216.57	\$ 8,128.49	\$29,345.06	.00829
Shop expense	\$ 122.17	\$ 122.17		.00003
Injuries and damages..... 62.00	298.10	360.10		.00010
 Grand total expense.....\$62,294.30	\$34,370.73	\$96,665.03		.02731
Total, year end'g June 30, '98. \$64,009.33	\$35,703.85	\$99,713.18		.03038
Total, year end'g June 30, '97. 74,750.82	35,390.56	110,141.38		.03696

COMPARISON OF WAGES PAID IN OPERATING EXPENSES.

For years ending June 30.

Account.	1899.	1898.	1897.
Maintenance:			
Buildings, track, wharf, etc.....	\$ 783.47	\$ 1,010.71	\$ 583.82
Steam plant	1,212.72	1,551.90	1,491.60
Electric plant	1,117.89	2,191.46	1,027.08
Miscl. tools, machinery, etc.....	663.03	472.21	142.44
Conduits	463.71	617.81	1,258.50
Towers and lamp posts.....	893.57	1,311.84	3,080.68
Arc lamps	3,508.99	1,752.30	3,092.33
Lines and cables.....	3,512.62	2,912.09	5,982.36
Total maintenance	<u>\$12,156.00</u>	<u>\$11,820.32</u>	<u>\$16,658.81</u>
Executive:			
Sal'y Sec'y and City Electr.....	\$ 3,799.92	\$ 3,799.92	\$ 3,700.00
Printing and stationery.....	....	....	....
Store room	847.81	1,139.98	1,199.92
Clerks and office expense.....	1,562.45	1,410.43	2,290.73
Civil engr. and draughting.....	1,179.92	1,296.56	1,693.07
Total executive	<u>\$ 7,390.10</u>	<u>\$ 7,646.89</u>	<u>\$ 8,883.72</u>
Station:			
Oils	\$	\$	\$
Waste .....	....	....	....
Coal .....	....	....	184.35
Miscellaneous supplies .....	....	....	713.54
Wages	21,469.63	22,004.39	19,966.69
Total station	<u>\$21,469.63</u>	<u>\$22,004.39</u>	<u>\$20,864.58</u>
Lighting:			
Trimming and patrolling.....	\$19,763.17	\$20,619.96	\$23,189.00
Carbons .....	....	....	....
Incand. lamp renewals.....	....	....	....
Incand. lamp expense.....	296.92	328.64	595.80
Globes and nets.....	....	....	....
Miscellaneous	27.87	175.56	....
Belle Isle Park.....	1,128.61	900.00	....
Total lighting	<u>\$21,216.57</u>	<u>\$22,024.16</u>	<u>\$23,784.80</u>
Shop expense	\$	\$ 513.57	\$ 4,545.41
Injuries and damages.....	62.00	....	13.50
Total wages paid.....	<u>\$62,294.30</u>	<u>\$64,009.33</u>	<u>\$74,750.82</u>

[Note.—After 1897 shop expense was partitioned between other accounts.]

COMPARISON OF OPERATING EXPENDITURES FOR STORES.

For years ending June 30.

Account.

	1899.	1898.	1897.
Maintenance:			
Buildings, track, wharf, etc.....	\$ 356.28	\$ 442.15	\$ 226.89
Steam plant	1,434.15	779.26	1,053.04
Electric plant	239.13	849.73	434.21
Miscl. tools and machinery.....	377.32	252.96	404.19
Conduits	55.77	79.98	96.46
Towers and lamp posts.....	52.54	780.54	975.58
Arc lamps	1,201.64	687.72	732.01
Lines and cables.....	1,540.76	612.95	999.87
Total maintenance	\$ 5,257.59	\$ 4,485.29	\$ 4,922.25
Executive:			
Salary Sec'y and City Electr.....	\$	\$	\$
Printing and stationery.....	517.16	574.44	962.08
Store room	37.70	5.63	19.79
Clerks and office expense.....	193.68	141.16	49.23
Civil engr. and draughting.....	33.49	102.45	38.47
Total executive	\$ 782.03	\$ 823.68	\$ 1,069.57
Station:			
Oils	\$ 994.99	\$ 1,058.16	\$ 1,445.55
Waste	235.05	212.67	250.68
Coal	17,873.34	17,857.72	16,532.80
Miscellaneous,	678.97	954.50	1,682.75
Wages .....	.....	.....	.....
Total station	\$19,782.35	\$20,083.05	\$19,911.78
Lighting:			
Trimming and patrolling.....	\$ 76.29	\$ 8.75	\$ 67.76
Carbons	6,295.98	7,765.82	7,118.05
Incand. lamp renewals.....	912.80	956.70	662.33
Incand. lamp expense.....	47.98	124.52	189.88
Globes and nets.....	517.02	460.61	492.90
Miscellaneous	185.25	319.61	95.66
Belle Isle Park.....	93.17	145.30	.....
Total lighting	\$ 8,128.49	\$ 9,781.31	\$ 8,626.58
Shop expense	\$ 122.17	\$ 202.82	\$ 662.38
Injuries and damages.....	298.10	327.70	198.00
Total supplies used.....	\$34,370.73	\$35,703.85	\$35,390.56

COMPARISON OF TOTAL OPERATING EXPENSES.

For years ending June 30.

Accounts.

	1899.	1898.	1897.
Maintenance:			
Buildings, track, wharf.....	\$ 1,139.75	\$ 1,452.86	\$ 810.71
Steam plant	2,646.87	2,331.16	2,544.64
Electric plant	1,357.02	3,041.19	1,461.29
Miscl. tools and machinery.....	1,040.35	725.17	546.63
Conduits	519.48	697.79	1,354.96
Towers and lamp posts.....	946.11	2,092.38	4,056.26
Arc lamps	4,710.63	2,440.02	3,824.34
Lines and cables.....	5,053.38	3,525.04	6,982.23
Total maintenance	\$17,413.59	\$16,305.61	\$21,581.06
Executive:			
Sal'y Sec'y and City Electr.....	\$ 3,799.92	\$ 3,799.92	\$ 3,700.00
Printing and stationery.....	517.16	574.44	962.08
Store room	885.51	1,145.61	1,219.71
Clerks and office expense.....	1,756.13	1,551.59	2,339.96
Civil engineering and drafting....	1,213.41	1,399.01	1,731.54
Total executive	\$ 8,172.13	\$ 8,470.57	\$ 9,953.29
Station:			
Oils	\$ 994.99	\$ 1,058.16	\$1,445.55
Waste	235.05	212.67	250.68
Coal	17,873.34	17,857.72	16,717.15
Miscellaneous supplies	678.97	954.50	2,396.29
Wages	21,469.63	22,004.39	19,966.69
Total station	\$41,251.98	\$42,087.44	\$40,776.36
Lighting:			
Trimming and patrolling.....	\$19,839.46	\$20,628.71	\$23,256.76
Carbons	6,295.98	7,765.82	7,118.05
Incand. lamp renewals.....	.912.80	956.70	662.33
Incand. lamp expense.....	344.90	453.16	785.68
Globes and nets.....	517.02	460.61	492.90
Miscellaneous	213.12	495.17	95.66
Belle Isle Park	1,221.78	1,045.30	.....
Total lighting	\$29,345.06	\$31,805.47	\$32,411.38
Shop expense	\$ 122.17	\$ 716.39	\$ 5,207.70
Injuries and damages.....	360.10	327.70	211.50
Total operating expenses.....	\$96,665.03	\$99,713.18	\$110,141.38

[Note.—After 1897 shop expense was partitioned between other accounts.]

FINANCIAL STATEMENT.

April 4, 1893, to June 30, 1899.

Covering Existence of the Commission.

APPROPRIATIONS AND RECEIPTS.

From City of Detroit:

Balance of lighting fund of 1893.....	\$ 8,226.29
From contingent fund, 1893.....	25,000.00
From bond issue, 1893.....	600,000.00
From bond issue, 1896.....	50,000.00
From taxes levied prior to 1893.....	4,379.89
From taxes levied 1893.....	175,000.00
From taxes levied 1894.....	174,362.44
From taxes levied 1895.....	158,278.27
From taxes levied 1896.....	150,000.00
From taxes levied 1897.....	204,780.00
From taxes levied 1898.....	79,000.00
Total from City of Detroit.....	\$1,629,026.89
From other sources:	
From Inspection Department.....	\$ 7,409.25
From work and material supplied other city departments	5,731.49
From sale of old material.....	4,542.06
From rent conduits and poles.....	1,825.97
From lighting public buildings.....	12,403.37
From accounts payable	24,761.71
Total from other sources.....	56,673.85
Grand total appropriation and receipts.....	\$1,685,700.74

DISBURSEMENTS.

Investment accounts:

Real estate	\$ 63,125.00
Conduits	86,558.20
Cables	37,187.04
Belle Isle outfit.....	24,228.01
Buildings and wharf.....	110,004.50
Shop machinery, tools, etc.....	8,014.16
Lines and poles.....	136,063.48
Towers and lampposts.....	97,436.95
Steam plant	111,847.47
Electric plant, arc.....	60,885.73
Electric plant, incandescent.....	13,404.03
Railway track and scales.....	10,982.31
Arc lamps and switches.....	54,066.59
Total investment	\$813,803.47

Operating expenses:

City lighting expense from April 4, 1893, to June 30, 1896:

Office expense	\$ 17,853.51
Advertising	319.16
Public lighting from private companies.....	381,459.72
Fuel	17,162.20
Carbons	8,741.79
Pay rolls	56,178.13
Printing and stationery.....	403.12
General supplies	4,366.37
Oil and rags	1,637.85
Teaming	2,192.60
Incandescent lamps	432.42
Globes and nets.....	676.93
	————— \$ 491,423.80
Operating expense 12 months to June 30, 1897..	\$ 110,141.38
Operating expense 12 months to June 30, 1898..	99,713.18
Operating expense 12 months to June 30, 1899..	96,665.03
Cost of labor and material for other city departments	7,382.45
Inspection department	7,332.20
Increase of stores.....	4,057.56
Work on City Hall tower.....	612.38
Accounts receivable .....	.651.48
Taxes charged back, 1893.....	1,487.28
Taxes charged back, 1894.....	2,525.59
Taxes charged back, 1895.....	3,063.44
Taxes charged back, 1896.....	3,421.58
Taxes charged back, 1897.....	12,469.86
	————— \$ 22,967.75
Total disbursements	\$1,654,750.68
Total appropriations and receipts.....	1,685,700.74
Excess of appropriations and receipts.....	\$ 30,950.06

Balance June 30, 1899:

City Treasurer	\$ 30,092.10
Secretary	875.96
	————— \$ 30,950.06

CASH STATEMENT.

Twelve Months to June 30, 1899.

RECEIPTS.

From lighting fund prior to 1893.....	\$ 5,000.00
From taxes of 1898.....	79,000.00
From taxes of 1897.....	142.03
From sale of old material.....	471.39
From work and supplies for other city departments	1,094.20
From rent of poles and conduits.....	732.62
From inspection department.....	2,578.25
From lighting public buildings.....	530.00
From decrease of stores.....	1,415.67
From increase in accounts payable.....	18,321.39

Total receipts	\$109,285.55
----------------------	--------------

DISBURSEMENTS.

For 12 months' operating.....	\$ 96,665.03
For 12 months' construction.....	23,657.74
For inspection department	2,213.35
For work and supplies for other city departments..	3,341.35
For work done on City Hall tower.....	612.38

Total disbursements	\$126,489.85
---------------------------	--------------

Excess of disbursements.....	\$ 17,204.30
------------------------------	--------------

Balances June 30, 1898, were:

City Treasurer	\$ 47,714.50
Secretary	439.86

\$ 48,154.36

Balances June 30, 1899, should be.....	\$ 30,950.06
--	--------------

Balance June 30, 1899, are:

City Treasurer	\$ 30,092.10
Secretary	857.96

\$ 30,950.06

DEPRECIATION ACCOUNT.

DEBITS.

To investment prior to June 30, 1897.....	\$729,222 73
To investment during year to June 30, 1898.....	60,923 00
To investment during year to June 30, 1899.....	<u>23,657 74</u>
Total amount charged to investment.....	\$813,803 47

CONTRA.

(See introductory remarks in annual reports of years referred to.)

By amount added to cost of lights for depreciation prior to June 30, 1897.....	\$ 40,145 73
By amount added to cost of lights for depreciation year ending June 30, 1898.....	22,500 00
By amount added to cost of lights for depreciation year ending June 30, 1899.....	<u>22,534 71</u>
Total amount added to cost of lights for depre- ciation	\$ 85,180 44
Balance, present investment.....	\$728,623 03
Detroit, June 30, 1899.	

BALANCE SHEET, JUNE 30, 1899.

Commercial National Bank, disputed claim.....\$	651.48	
Petty cash balance.....	857.96	
Appropriation balance		\$126,368.40
City Treasurer cash balance.....	30,092.10	
Incandescent light account.....		530.00
Old material sold.....		471.39
Rentals poles and conduits.....		732.62
Pay rolls	67,671.51	67,671.51
Inspection department disbursements.....	2,213.35	
Inspection department receipts.....		2,578.25
Public lighting prior to 1893.....		5,000.00
Work for other city departments, disbursements...	3,341.35	
Work for other city departments, receipts.....		1,094.20
Will F. Conant, balance held.....		110.27
Supplies in stock:		
Coal	\$1,028.41	
Carbons	1,969.19	
Oils	56.41	
Waste	16.41	
Incandescent lamps	235.11	
Globes and nets.....	532.05	
Trans. ropes	104.70	
Dynamo brushes	115.28	
	4,057.56	
Accounts payable		24,651.44
One year's operating expense (see statement)....	96,665.03	
One year's construction expense (see statement)...	23,657.74	
	\$229,208.08	\$229,208.08

BALANCE SHEET, BOOKS CLOSED JUNE 30, 1899.

Commercial National Bank.....	\$ 651.48
Petty cash balance.....	857.96
Appropriations, balance June 30, 1899.....	\$ 13,144.54
City Treasurer's cash balance.....	30,092.10
W. F. Conant, balance held.....	110.27
Stores on hand.....	4,057.56
Accounts payable	24,651.44
Other departments for work done.....	2,247.15
	<hr/>
	\$ 37,906.25
	\$ 37,906.25

ASSETS AND LIABILITIES.

June 30, 1899.

ASSETS.

City Treasurer's cash balance.....	\$30,092.10
Secretary's cash balance.....	857.96
Accounts receivable	2,898.63
Stores on hand.....	4,057.56
	<hr/>
Total assets	\$37,906.25

LIABILITIES.

Accounts payable	\$24,761.71
Excess of assets.....	\$13,144.54

OFFICE OF THE PUBLIC LIGHTING COMMISSION.

Detroit, July 15th, 1899.

Hon. C. H. Ritter,

President Public Lighting Commission,
Detroit, Mich.

Dear Sir:—

This is to certify that the disbursement vouchers of the Commission for the fiscal year ending June 30, 1899, have been examined by the Auditing Committee and approved.

F. F. INGRAM,
JOHN MINER,
Auditing Committee.

OFFICE OF CITY TREASURER.

Detroit, July 15, 1899.

Hon. C. H. Ritter,
 President Public Lighting Commission,
 Detroit, Mich.

Dear Sir:—

The books of this office show that for the fiscal year ending June 30, 1899, the receipts and disbursements for the account of the Public Lighting Commission have been as follows:

Balance July 1, 1898.....	\$ 47,714.50
Receipts from sundry sources.....	<u>88,503.01</u>
<hr/>	
Total	\$136,217.51
Total vouchers paid.....	<u>\$106,125.41</u>
<hr/>	
Balance June 30, 1899.....	\$ 30,092.10

Yours respectfully

WM. B. THOMPSON,
 City Treasurer.

OFFICE OF THE PUBLIC LIGHTING COMMISSION.

STATE OF MICHIGAN, }
 County of Wayne, } ss.

Ford Starring, Secretary of the Public Lighting Commission, being duly sworn, says, that the accounts of the Public Lighting Commission have been examined and verified by him from April 4th, 1893, to June 30th, 1899, and that the statements published herewith are statements drawn correctly from the books of the Commission.

(Signed) FORD STARRING.

Subscribed and sworn to before me
 this 15th day of July, 1899.

A. S. GUERIN,
 Notary Public, Wayne Co., Mich.

OFFICE OF CITY ACCOUNTANT.

Detroit, June 30, 1899.

Hon. C. H. Ritter,

President Public Lighting Commission.

Dear Sir:—

I have examined the books of the Commission for the fiscal year ending this date and find them as follows:

RECEIPTS.

From lighting fund prior to 1893.....	\$ 5,000.00
From taxes of year 1898, total appropriation.....	79,000.00
From taxes of year 1897.....	142.03
From sale of old material.....	471.39
From work and supplies for other departments.....	1,094.20
From rental of poles and conduits.....	732.62
From Inspection department.....	2,578.25
From lighting public buildings.....	530.00
From decrease of stores in hand.....	1,415.67
From increase of accounts payable.....	18,321.39
Total receipts	\$109,285.55

DISBURSEMENTS.

For 12 months operating of plant.....	\$96,665.03
For 12 months construction.....	23,657.74
For Inspection department expenses.....	2,213.35
For work and supplies for other departments.....	3,341.35
For work done on City Hall tower.....	612.38
Total disbursements	\$126,489.85
Excess of disbursements.....	\$ 17,204.30
Cash balances on hand June 30, 1898, were:	
Secretary	\$ 439.86
City Treasurer	47,714.50
Total cash on hand that date.....	\$ 48,154.36
Difference in cash on hand June 30, 1899	\$ 30,950.06
balances June 30, 1899, are:	
Secretary	\$ 857.96
City Treasurer	30,092.10
	\$ 30,950.06

I have the honor to be,

Yours very respectfully,

DR. FRANCIS J. DUCAT.

City Accountant.

Estimate for Year Ending June 30, 1900.

OFFICE OF

PUBLIC LIGHTING COMMISSION.

Detroit, January 12th, 1899.

Hon. F. A. Blades, Controller, City of Detroit.

Dear Sir:—

As per your request of December 20th, 1898, we present herewith an estimate of the funds we deem necessary for the operation, maintenance, extensions and improvements of the Public Lighting System of the City of Detroit for the fiscal year ending June 30, 1900.

The estimates are based on the operation of an average of 1,925 arc lights and 4,200 incandescent lights connected, for that year. A safe figure of cost computed on the last 18 months' operations, as per the published reports of the Commission, would be at \$50.00 per annum per arc light and at \$3.00 per annum per incandescent light.

In these figures we make no allowance for a fund for emergency purposes, and any unusual expenses would find us without the necessary means to meet the same. Last year we asked for an emergency fund of \$10,000, but it was not allowed.

We therefore ask for operating and maintenance as follows:

1,925 arc lights at \$50.00 each.....	\$ 96,250.00
4,200 incandescent lights at \$3.00 each.....	12,600.00
Total	\$108,850.00

For the extensions of the street lighting for the fiscal year ending June 30th, 1900, we believe that 100 arc lights will be sufficient. To arrange for this extension, will be required an enlargement of our present generator room, or an exchange of some of our present machinery for machinery of greater capacity in larger units. We believe the latter the better plan.

The arc plant as constituted has never had enough machinery in reserve to allow an engine to be out of commission for a period to exceed eight or ten hours. To give us this necessary reserve power we have placed in the estimates the item of three direct connected sets of arc machinery, one of which is to take care of the 100 arc lights asked for in this estimate, the other two are for reserve purposes in case of accident to, or trouble with, any one of the large triple expansion marine engines roped to four generators each.

The present machinery for incandescent lighting consists of three compound Westinghouse engines belted to three 55-Kilowatt Westinghouse alternators, having a lighting capacity of but 3,000 lights, or barely sufficient to take care of the demands on the plant at certain seasons of the year, leaving nothing in reserve. We believe that it will be wise to purchase two direct connected engines and alternators, either one of which will carry the entire incandescent lighting load of the plant. These direct-connected sets can be placed in the north end of the engine room in space that is not otherwise utilized, and the space made vacant by the present two Westinghouse sets, will be sufficient in which to install the three engines each direct connected to an arc light generator.

The advantage of this change, besides providing more floor space, and an increased capacity in the incandescent department, will materially reduce the cost of incandescent lighting.

For the improvement of the plant and the extensions of the service for the fiscal year ending June 30th, 1900, we would therefore respectfully submit the following estimate:

3 engines and arc dynamos, direct connected, complete with foundations, steam piping, switchboard connections, etc.....	\$ 16,500.00
2 engines and alternators, direct connected, complete with foundations, steam piping, switchboard connections, etc.....	21,500.00
Lines for 100 arc lights.....	6,150.00
100 arc lamps and switches.....	2,000.00
Cost of operating 100 additional lights at \$50.00.....	5,000.00
 Total	 \$ 51,150.00

The style of and arrangement of the machinery is not yet definitely decided on, but the cost will approximate the above.

The allowances granted this Commission for the fiscal year ending June 30th, 1899, having been made at a minimum figure, there will be funds barely sufficient to carry out the plans of the Commission, so that there is no probability of a balance being on hand at the end of the year.

We would, therefore, respectfully ask that an appropriation be made of \$108,850.00 for the operation and maintenance of the present plant, and of \$51,150.00 for the improvements, the extensions and the operation of the extensions, making a total asked for of \$160,000.00.

We have the honor to be

Yours respectfully,

THE PUBLIC LIGHTING COMMISSION.

OFFICE OF CITY CONTROLLER.

Detroit, June 27, 1899.

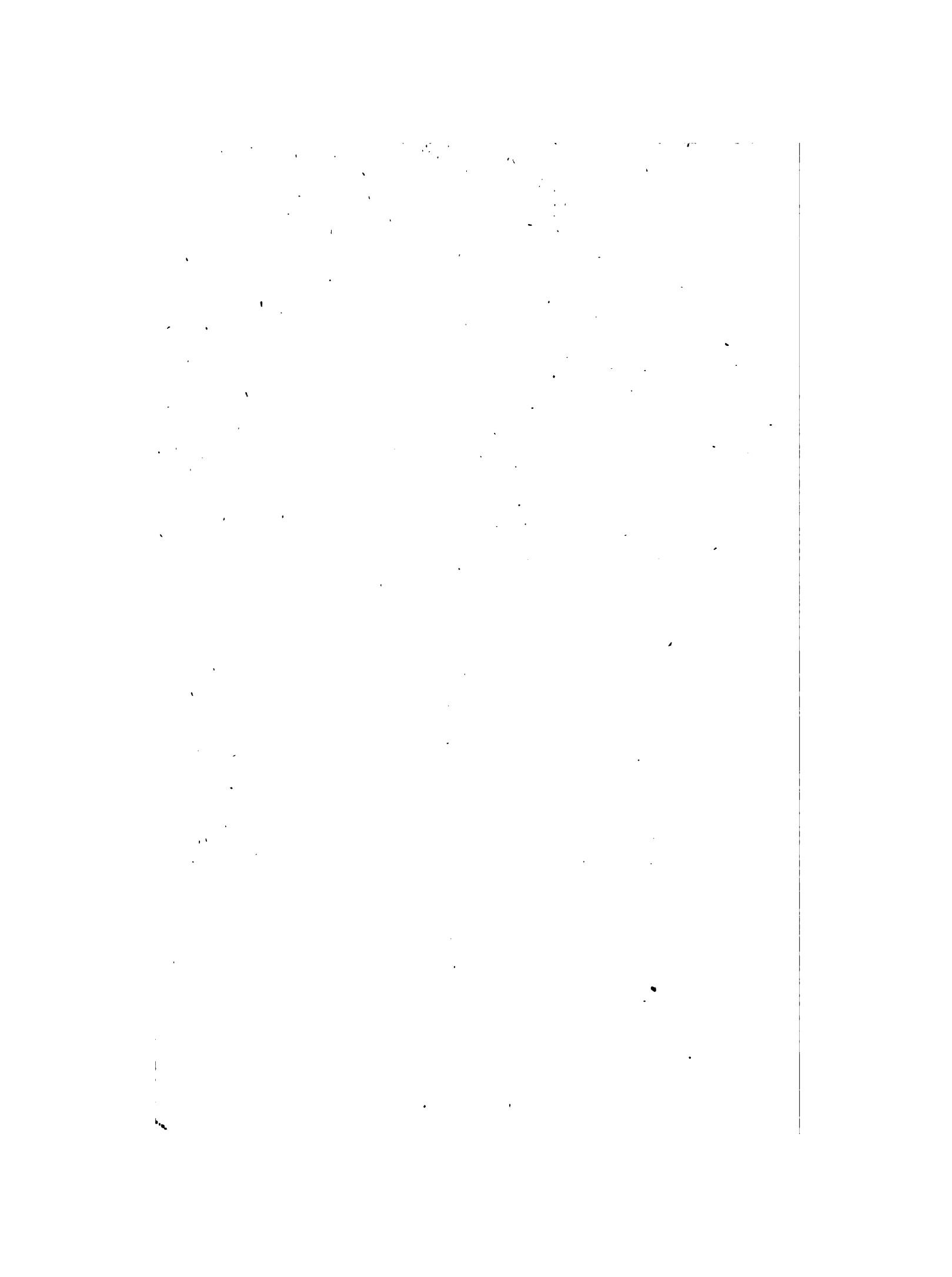
ESTIMATES ALLOWED.

The Board of Estimates of the City of Detroit, after considering the estimates submitted by the Public Lighting Commission for the operating and maintenance of the present plant and for the improvements and extensions of the Public Lighting system granted the following:

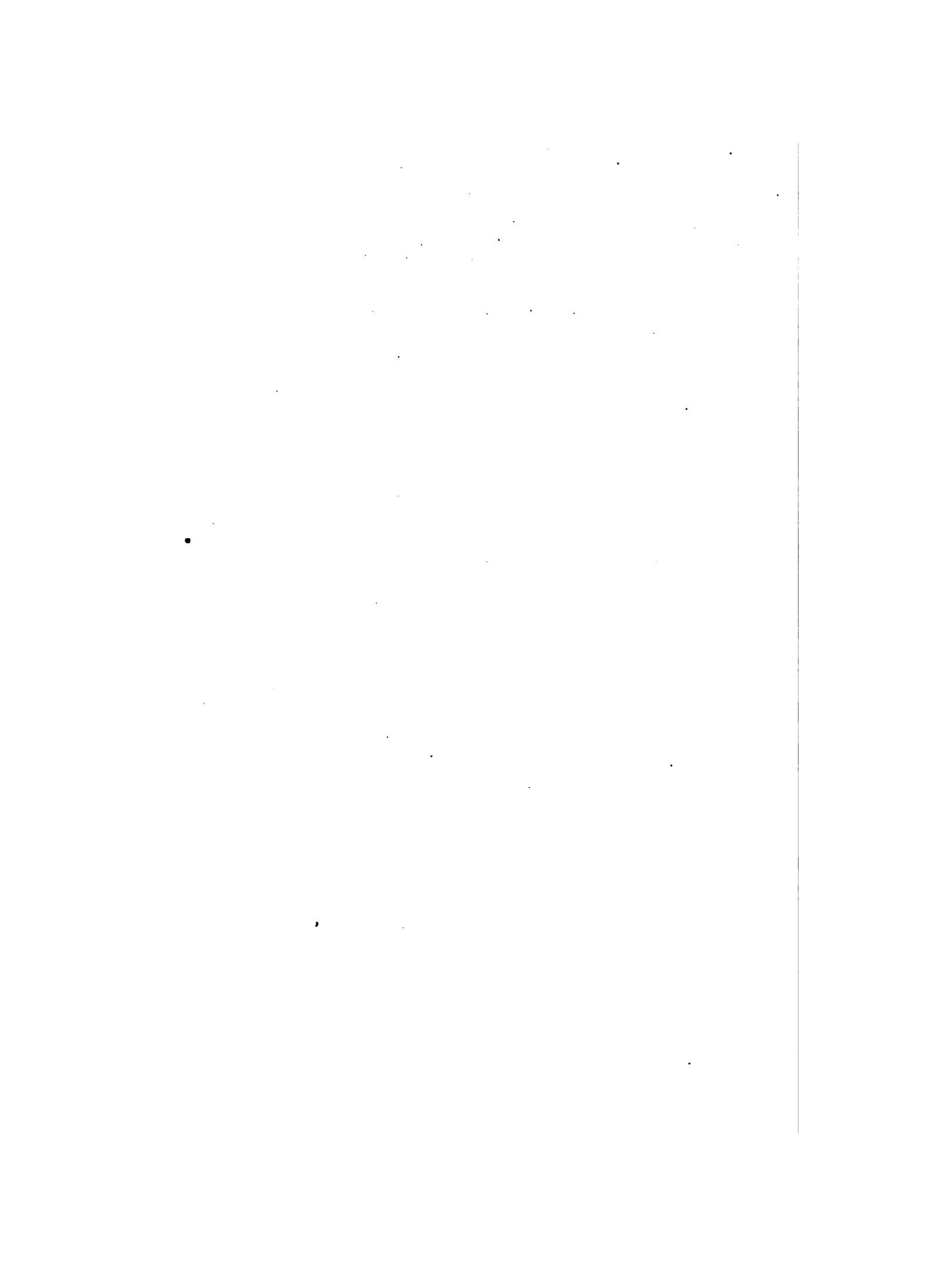
For operating and maintenance of the present plant.....	\$ 95,000.00
For extensions and improvements:	
To provide 100 additional arc lights, 2 engines and arc dynamos, direct connected, complete with foundations, steam piping, switchboard connec- tions, etc.....	\$ 11,000.00
Lines for 100 lamps.....	5,000.00
100 lamps and switches.....	1,500.00
Operating 100 additional lights.....	3,000.00
For 2 engines and alternators, direct connected, com- plete with foundations, steam piping, switchboard connections, etc.....	18,000.00
Extensions of the incandescent system to the House of Correction and intermediate points.....	3,445.00
Total for extensions and improvements.....	\$ 41,945.00
Total amount appropriated.....	\$136,945.00

F. A. BLADES,

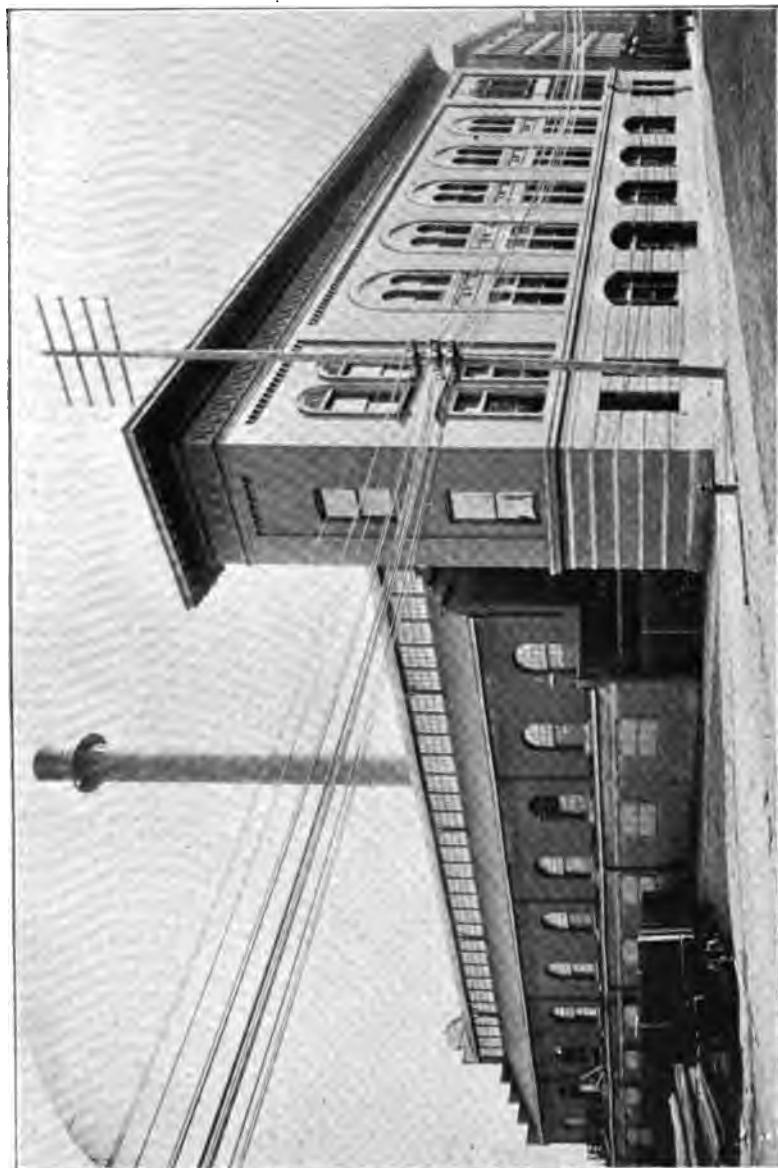
Controller.



Descriptive Illustrations.

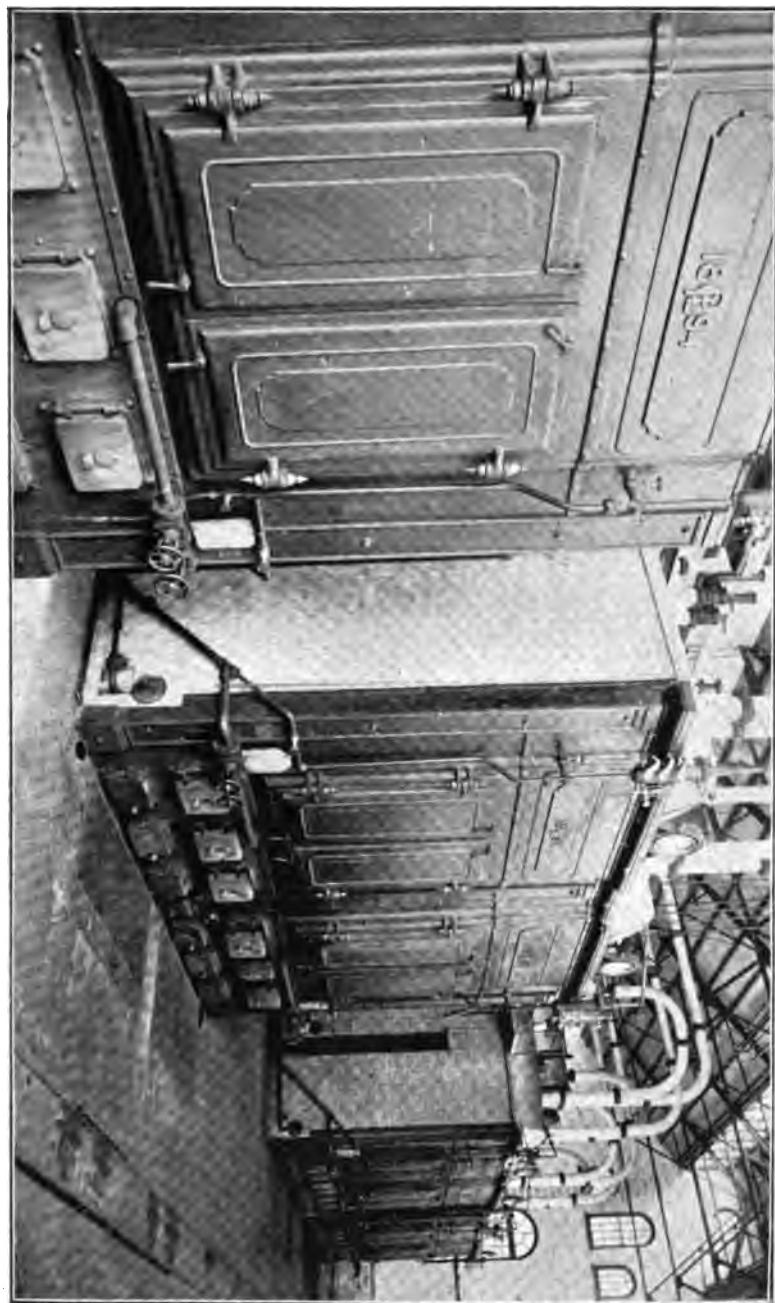


OFFICE AND STATION BUILDINGS.



GENERATOR ROOM.





BOILER ROOM.



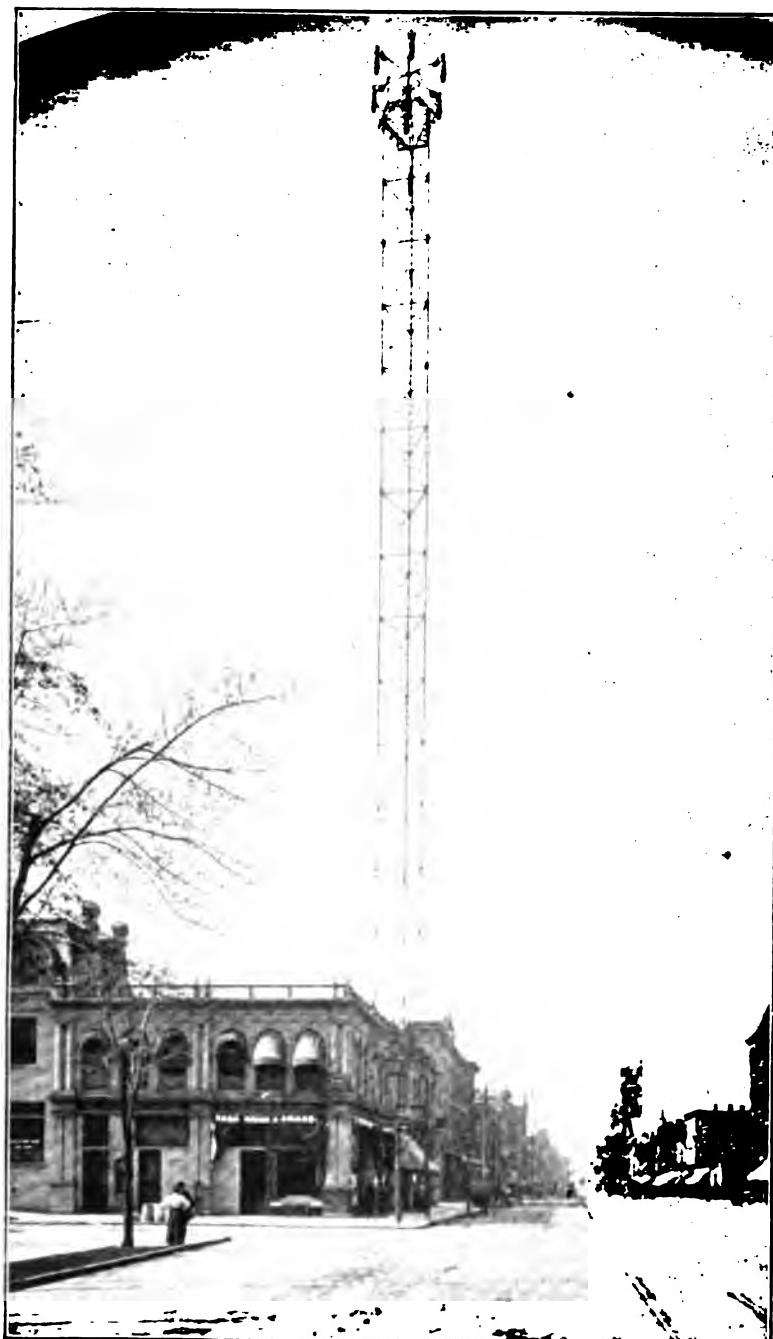
CRANE LIGHT.



CENTER SUSPENSION LIGHT.

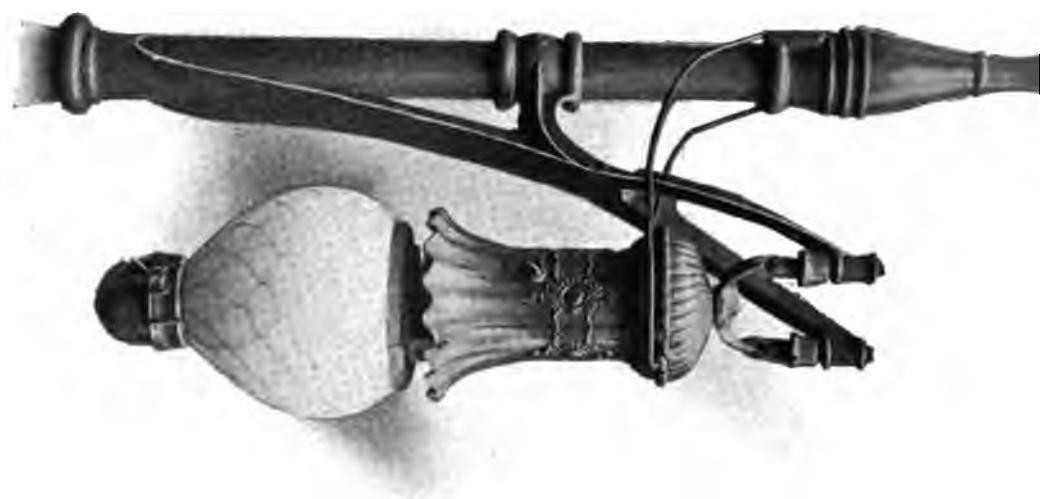


POST LIGHT.

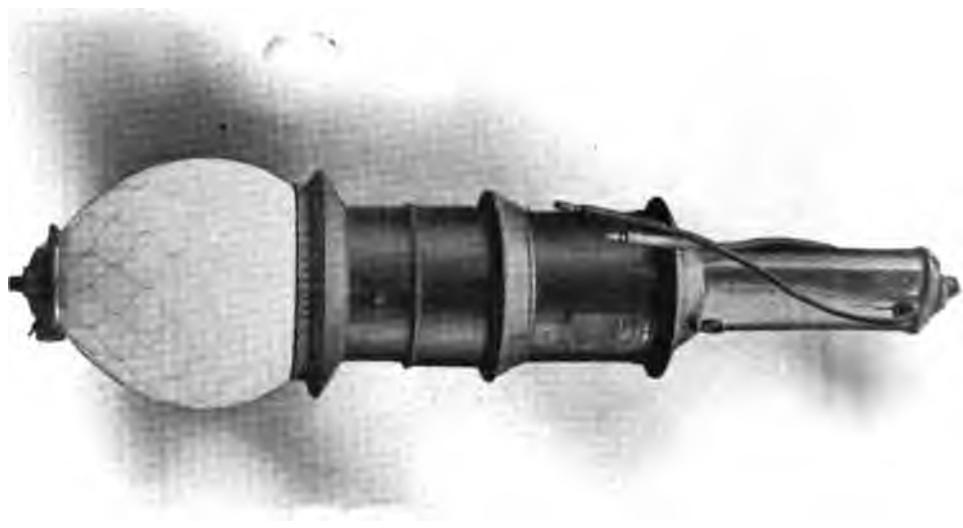


TOWER LIGHT.

LAMPS ON POSTS.



LAMPS ON TOWERS.



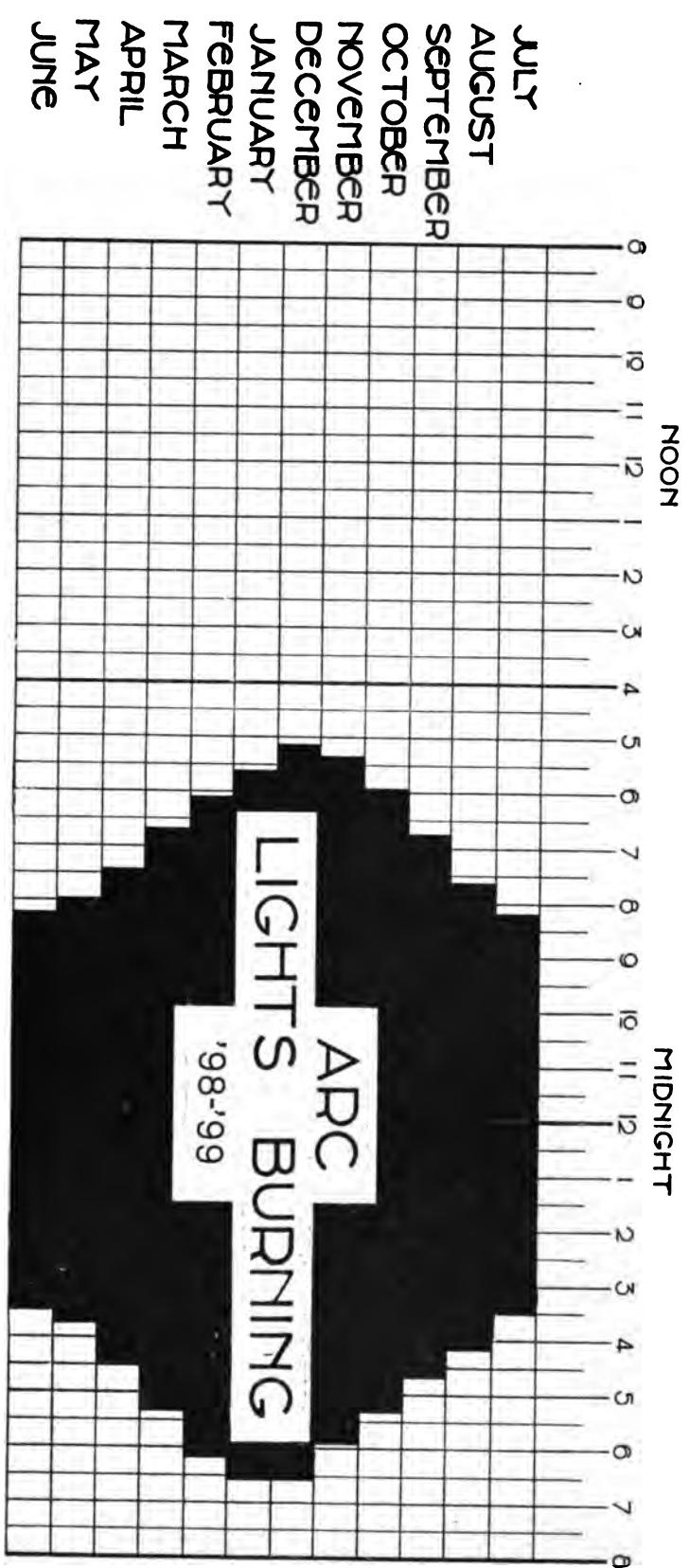
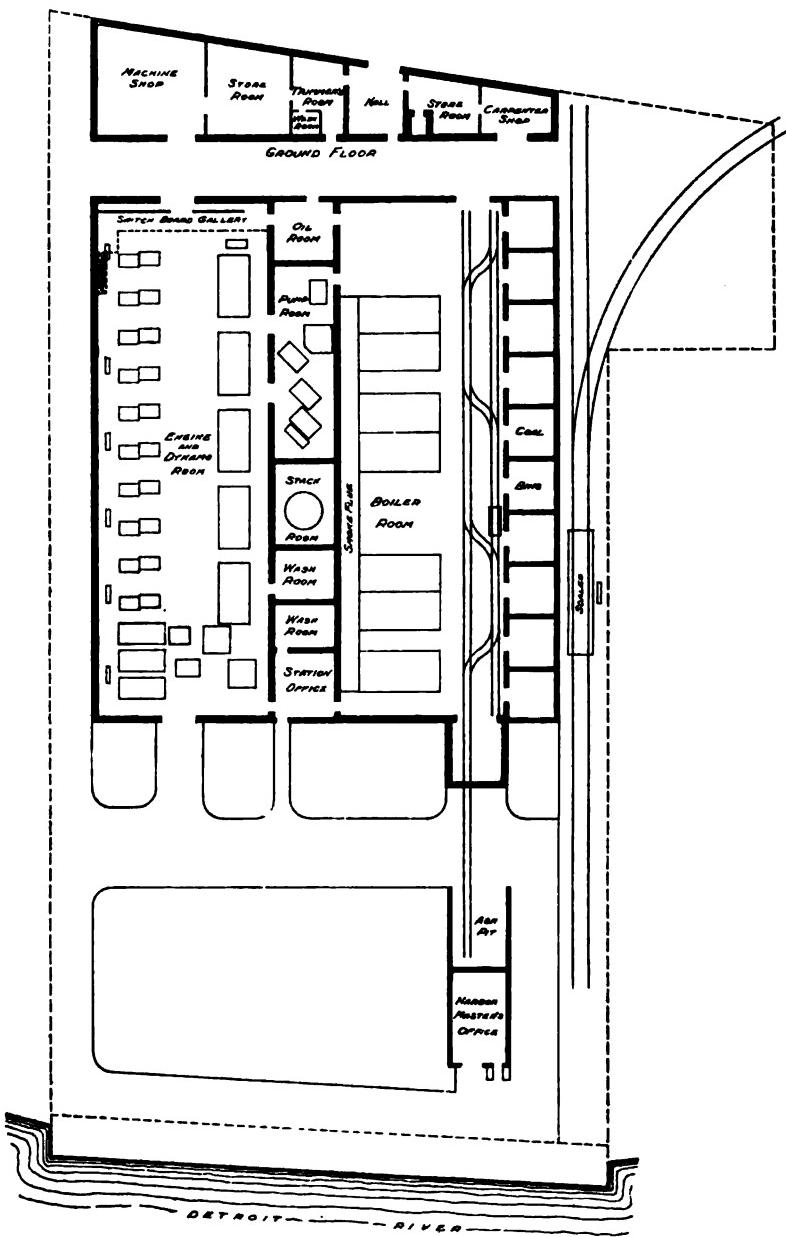
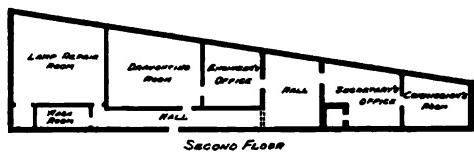
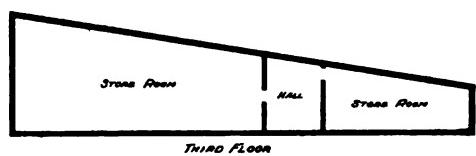


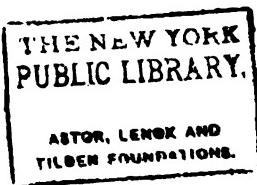
CHART IN BLACK REPRESENTING PERIOD OF ARC LIGHTS BURNING.

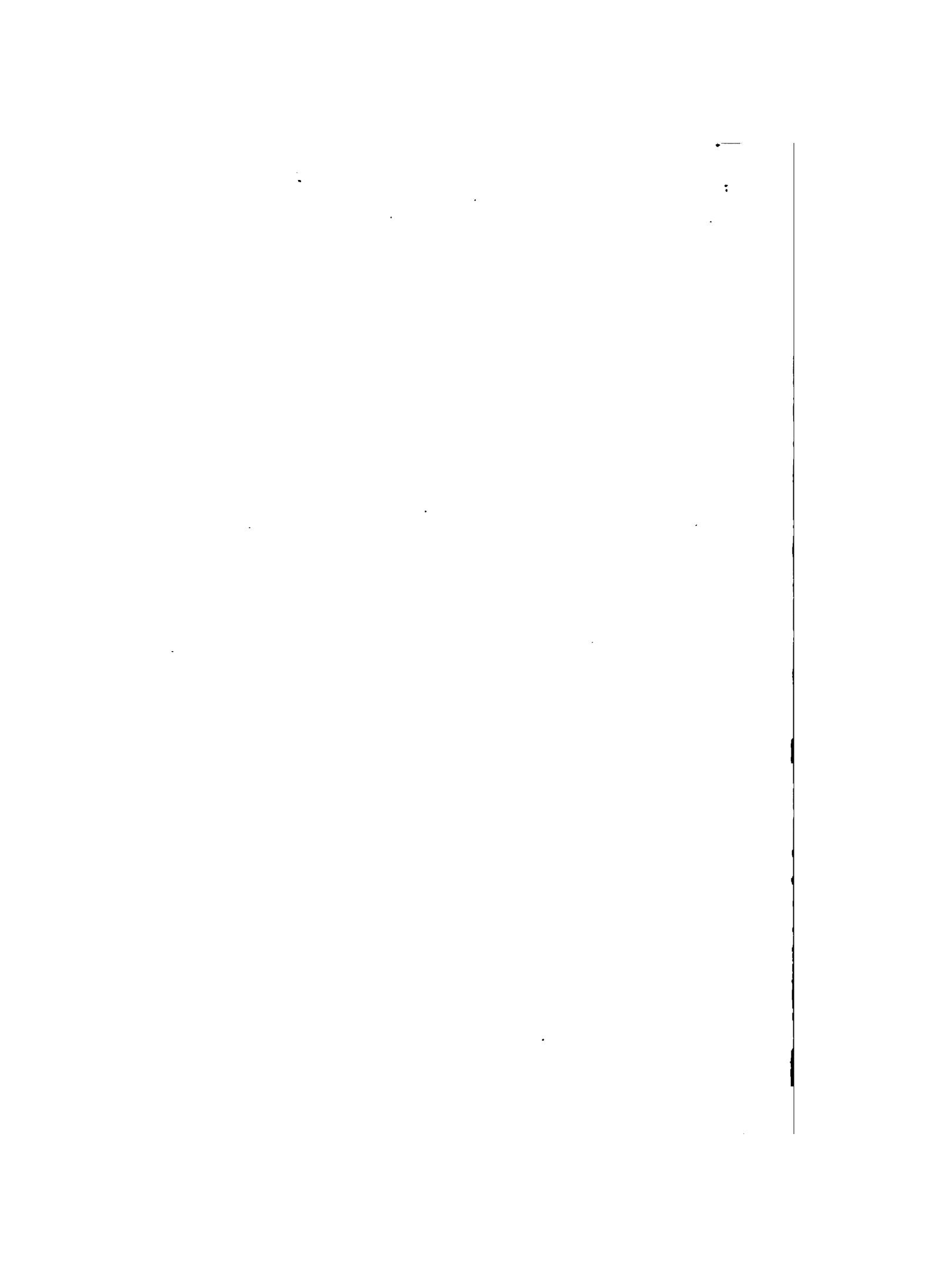


GROUND PLAN OF PUBLIC LIGHTING STATION.



REAR VIEW OF STATION BUILDINGS.







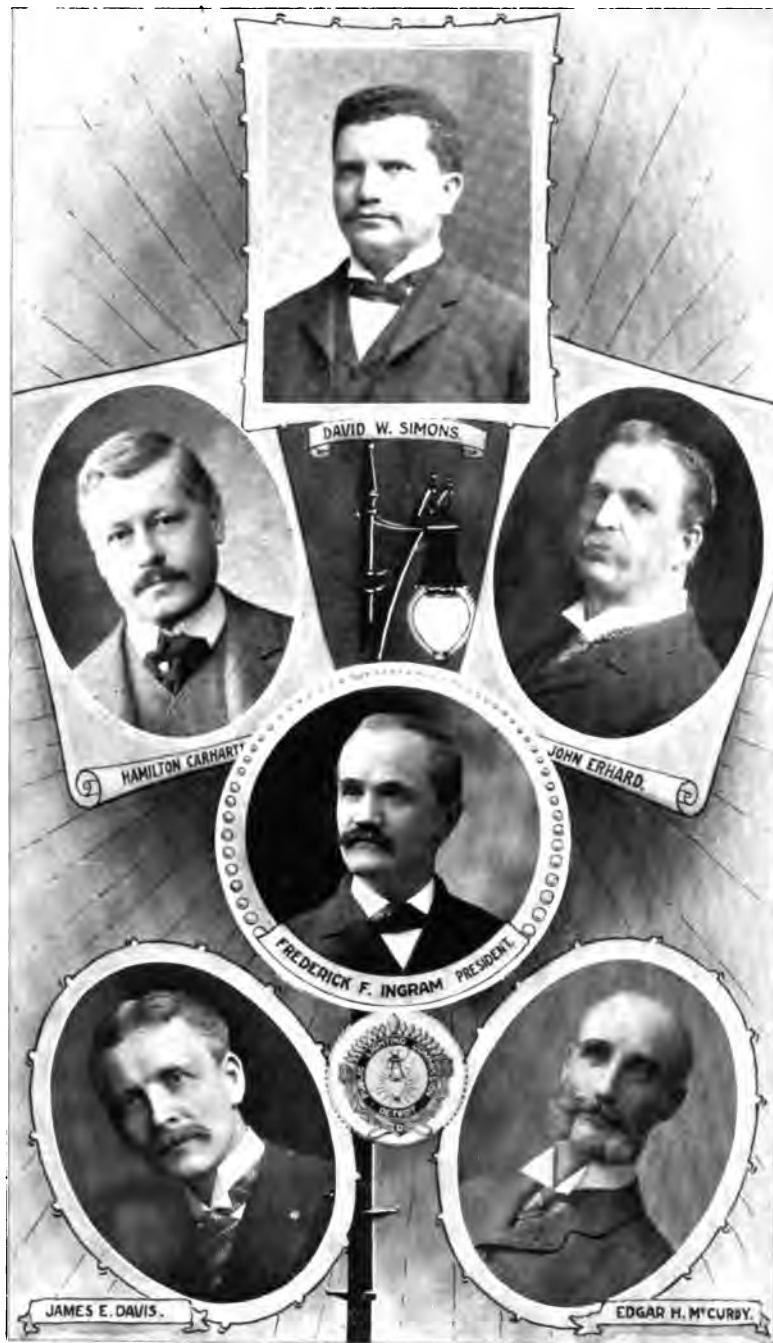
PUBLIC LIGHTING COMMISSION

THE CITY OF TORONTO

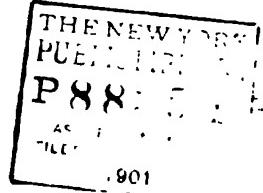


OFFICE AND STATION BUILDINGS.





PUBLIC LIGHTING COMMISSIONERS,
1900.



FIFTH

ANNUAL REPORT

OF THE

Public Lighting Commission

CITY OF DETROIT.

Fiscal Year Ending June 30, 1900.

THE COMMISSION.

FREDERICK F. INGRAM, President... Term expires April 4, 1904
HAMILTON CARHARTT, Vice-Pres't..Term expires April 4, 1901
E. H. McCURDY.....Term expires April 4, 1902
JAMES E. DAVIS.....Term expires April 4, 1903
D. W. SIMONS.....Term expires April 4, 1905
JOHN ERHARD.....Term expires April 4, 1906
ARTHUR S. GUERIN.....Secretary.
WILLIAM M. DALY..City Electrician and Gen'l Supt.
AUSTIN S. HATCH.....Assistant Gen'l Supt.
Custodian of Funds.....WM. B. THOMPSON, City Treasurer.
Auditor of Accounts.....F. A. BLADES, City Controller.
City Accountant.....FRANCIS J. DUCAT.

The Ex-Members of the Commission are:

C. A. NEWCOMB, April, 1893, to July, 1893.
MARTIN BUTZEL, April, 1893, to April, 1894.
GEORGE H. LOTHROP, April, 1893, to April, 1896.
W. A. JACKSON, April, 1893, to July, 1896.
EDWIN HENDERSON, April, 1896, to December, 1896.
W. R. FARRAND, April, 1893, to April, 1897.
J. L. HUDSON, April, 1893, to May, 1898.
JOHN ATKINSON, July, 1896, to July, 1898.
R. H. FYFE, July, 1893, to October, 1899.
C. H. RITTER, April, 1894, to January, 1900.
JOHN MINER, December, 1896, to January, 1900.
W. A. LIVINGSTONE, April, 1897, to January, 1900.



DETROIT, July 31st, 1900.

TO THE HONORABLE THE COMMON COUNCIL,
City of Detroit, Michigan.

GENTLEMEN:

The Public Lighting Commission respectfully submits for your consideration the accompanying report of the business intrusted to its care during the fiscal year ending June 30, 1900.

In the report an effort has been made to present such data as will best convey an understanding of the work done, the costs of Municipal Lighting, and the condition of the city's investment.

We have the honor to be,

PUBLIC LIGHTING COMMISSION,
By FREDERICK F. INGRAM, President,
ARTHUR S. GUERIN, Secretary.

Office of Public Lighting Commission.

Detroit, August 1st, 1900.

To the Honorable
The Public Lighting Commissioners:

Gentlemen:—

In presenting this the fifth annual report of the Commission, covering the business transactions and operations of the Public Lighting Plant for the fiscal year ending June 30th, 1900, it gives me pleasure to show that while a considerable decrease in the cost of the operation of the plant has been accomplished, at the same time we have advanced wages in our working force (notably, increasing the minimum wage from \$1.00 to \$1.50. and the oilers from \$1.50 to \$1.75 per day), and have given the plant, lines and lamps a general overhauling, repairing, replacing, painting, etc., which extraordinary expense has been charged to operating. When all these repairs shall have been completed, by the end of this summer, the plant will be in as good condition as when new.

The entire maintenance and operating cost for the year was \$90,087.73, as compared with \$96,665.03 for the preceding year, a saving of \$6,577.30, although the output was greater by 249,483 Kilowatt hours. This reduction may be sub-divided among the different departments in the following manner:

	Wages:		Stores.	
	Increase.	Decrease.	Increase.	Decrease.
Maintenance	\$ \$2,081.35	.....	\$ 871.12	
Executive .....	..... 83.43	235.21	.....
Station .....	..... 500.93	.....	1,345.97	
Lighting .....	..... 4,819.20	2,786.99	.....
Shop supplies .....	.....	14.00	.....
Injuries and damages	87.75	0.75	.....
 Totals	 \$ 87.75	 \$7,484.91	 \$3,036.95	 \$2,217.09
Total decrease	7,397.16	.....	.....
Total increase .....	.....	.....	.....	819.86
Net decrease .....	.....	6,557.30	.....

Careful consideration of labor-saving methods and devices, together with the elimination from our pay roll of unnecessary superintendence and redundant officials, has enabled us to increase the average wages paid, while the total amount of the annual pay roll shows a very considerable reduction, and when the enormous advance in the cost of stores during the fiscal year just closed is considered, especially iron, steel, copper and carbons, the very small increase shown in cost of stores in connection with our increased output is equally gratifying.

The total output for the station for the year was as follows.

For arc lighting.....	3,327,453	Kilowatt Hours.
For incandescent lighting.....	461,597	" "
Making a total of.....	3,789,050	" "

Total output for preceding year was..... 3,539,567 " "

The average number of 2,000 candle power arc lights operated during the year was 1,963, as compared with 1,868 for the preceding year, an average increase of 95 lights. While the average for the year was only 1,963, on June 30th, 1900, the last day of the fiscal year, the Commission was operating 2,002 arc lights of 2,000 candle power.

The method of arriving at the actual cost of an arc light per annum to the City is carried out in this year's report in the same manner as it has been in previous years. To the cash cost of operating the lighting plant is added fixed charges, as follows:

Depreciation on the entire investment, June 30th, 1900, of \$742,907.56, at 3%.....	\$ 22,287.22
Interest on the net investment July 1st, 1899, \$728,623.03, for one year at 4%.....	29,144.92
Lost Taxes (the amount the city would get as taxes were the plant owned by a private corporation) are figured by charging to the operation of the plant at the regular rate of taxation for the city, county and state (\$19.93 for each \$1,000 of assessed value). After a very thorough examination into the assessed value of other plants of a like character in the city, and after having made exten- sive comparisons of real estate, output, machinery im- stalled, etc., it appears that were this a private plant, and assessed on the same basis as are other similarly located properties and electric lighting plants in this city, it would be placed upon the tax roll at \$351,885.00.	.
This amount at \$19.93 per \$1,000.00 is.....	7,013.06
Cash cost of operation is.....	90,087.73
Making a total cost of.....	\$148,532.93

This total cost of operation, including fixed charges proportioned between the arc and the incandescent plants in relation to the respective output of each for the year, is as follows:

Arc Plant	\$130,437.16
Incandescent Plant	18,095.77
Total.....	\$148,532.93

The above cost of operating the arc plant, divided by the average number of arc lights operated during the year (1,963), gives the gross cost for each arc light operated, \$66.45.

The amount subdivided is as follows:

Operating disbursements	\$40.30
Interest at 4% on investment.....	12.89
Depreciation at 3% on investment.....	10.12
Lost taxes on investment	3.14
Total.....	\$66.45

The gross cost for each arc light for the previous fiscal year was \$75.56 (cash cost \$46.46), which shows a saving this year over last of \$9.11 gross cost, and \$6.16 cash cost for each 2,000 candle power arc light.

While \$66.45 per annum is the actual cost to the Commission for the past fiscal year of a 2,000 candle power arc light, the Commission has been able to accumulate certain other incomes besides the tax levy, and have also assumed certain expenses incident to and inseparable from city government that were paid from city taxes before the existence of the Public Lighting Commission, and that would continue to be a burden to the taxpayer should the city again be lighted by contract with a private corporation.

Therefore, to arrive at the actual cost of an arc light to the taxpayer, there should be deducted from the above figure such receipts as come from other sources than the tax levy, and such expenses as are imposed upon the Lighting Commission that are not incident to public lighting.

For instance, before the establishment of the Public Lighting Commission, the City of Detroit had a City Electrician who looked after the enforcement of the lighting contract, the stringing of overhead wires, connections to buildings for lighting purposes, and many such matters as are now supervised by this Board. Were this Board not in existence the city would still have such an officer, who would draw a salary from the public funds.

The department also collects annually sums of money for the rental of poles, conduits, railway track, sale of old material, sale of incandescent lighting, etc.

SIX-LIGHT TOWER ON CAMPUS MARTIUS.

Of underground conduits the Commission has about four times as many ducts as are in use to-day. This excess of conduits was constructed on the understanding that all underground wires, either public or private,



should be required to occupy them, thus avoiding the continual tearing up of our pavements by private companies. If such an ordinance were passed and its provisions enforced, the conduits would be a source of income and profit to the city and convenience and economy to the private companies, but in the absence of such regulation by the Common Council, public lighting should not be charged with them beyond the proportion used in public lighting. A deduction may justly be made of the interest, depreciation and loss of taxes on account of this increased investment.

These items for the fiscal year are as follows:

Proportion of the City Electrician's and Assistant City Electrician's time spent on outside matters as above indicated,	
per annum	\$ 1,200.00
Collections from rentals, etc.....	4,545.44
Interest on $\frac{3}{4}$ conduit investment at 4% per annum.....	2,332.27
Depreciation on $\frac{3}{4}$ conduit investment at 3% per annum.....	1,842.96
Lost taxes on $\frac{3}{4}$ conduit investment, assessed value of \$28,162.00 at \$19.93 per \$1,000.....	561.27
A total of	\$10,481.94

The cash cost of an arc light for the year being \$40.30, and the fixed charge cost being \$26.15, a deduction from the cash cost of the first two items reduces it to \$37.73, while a deduction from the fixed charge cost of the last three items reduces it to \$24.03, making the gross cost to the taxpayer of a 2,000 candle power arc light for the past year \$61.76 and cash cost \$37.73.

While we have charged to the annual cost of a 2,000 candle power arc light \$3.14 for taxes lost to the city because the property under the Commission's control, being owned by the city, is not taxed, when considering the issue of public versus private ownership of public utilities it is well to bear in mind that the property of private corporations performing public service in this city, such as the telephone and transportation companies, amounting to many millions of dollars, pay also no municipal taxes. The taxes lost on property belonging to private corporations engaged in public service may properly be charged to the lack of foresight or indifference that permitted such conditions to become established.



MAST ARM.

The past year having been the fifth year of operation of the plant, a large number of needed repairs were necessary in the latter portion of the year. A comparison of the cost of operation this year with the cost last year for the month of June will clearly show the increased expense the Commission has incurred. At the end of the present summer season, when all these repairs have been completed, the property will be in as good condition as when new, although the large amount of repair work laid out will also increase the cost of operation for the coming year.

The past year has seen the installation of one new direct connected arc lighting set in the station, consisting of one 100 H. P. Willan's triple expansion, two line engine and one 57½ Kilowatt Western Electric bi-polar dynamo, which will operate 125 arc lights of 2,000 candle power. By way of explanation it might be stated that this set, while only installed this year, is included in the previous year's investment disbursements and capacity of the plant. The set was contracted for in the summer of 1898, and at the time of the issue of the last year's report appeared on the books as an "Account Payable," but was not installed and operated to the satisfaction of the Commission until April, 1900.

The annual reduction in cost of public lighting reported by this Commission each year since the establishment of the municipal lighting plant has been further reduced by this year's operation by over 13 per cent. This, with Detroit's reputation of being the best lighted city in the United States, should not obscure the fact that low price and best service are not the only and perhaps the most important advantages that have resulted to the citizens and taxpayers from municipal ownership of the public lighting plant. The political health of the city has been improved by placing one branch of the public service beyond the reach of franchise-seeking corporations, and the attention of our city government is not now distracted by the bickering and bargaining of such corporations eager to obtain the privileges and the profits that may be secured through contracts for public lights.

Under private ownership any economy in management or saving in cost would go to the private corporation, not to the taxpayer or employe as now, for while the cost of public lights has been largely reduced under public ownership we have, at the same time, paid the top wages and adopted the eight-hour day.

With tenure of position dependent solely upon efficiency and a system of promotion in service according to merit and fitness, the Commission finds itself to-day admirably officered and with a list of loyal employes upon whom it can rely with the utmost confidence for the safe and proper operation of the plant. The faithful and devoted services of our officers and employes to their several duties, (inspired as it has been by the unexampled self-sacrifice of the Commissioners in employing so much of their own thought, time and attention to the affairs of the business) entitles them to a good share of whatever credit may be due the Commission from the annual report herewith submitted.

Yours respectfully,
FREDERICK F. INGRAM,
President.

THE CITY'S LIGHTING PLANT.

The property owned and controlled by the Public Lighting Commission now consists of the following :

The power house and office building located on Atwater street, between Bates and Randolph, having a frontage on Atwater street of 213 feet, 163 feet of which extends back an average of 318 feet 6 inches to the river front and 50 feet of which on the east extends back only a distance of an average of 68 feet. (The complete plan of the station will be found on page 25.)

The boiler house contains seven Double Deck Tubular Boilers, C. C. Peck design. Each boiler has 3,000 square feet of heating surface and is equipped with the Hawley Down Draft Furnace and Hoppes Live Steam Purifier and Worthington Water Meter. Four of these boilers are used at one time to operate the plant, the other three being kept in reserve. A change is made every six weeks, and each boiler is given a complete over-hauling and cleaning. The coal charging cars on a "Hunt" industrial railway have a capacity of 800 tons. A side track built by the street, and connected with the street, allows cars of coal to be unloaded directly into the coal bins adjoin the firing floor and its own track scales and all coal on "our weights."

as it is put out of commission hauling and cleaning. The coal charging cars on a "Hunt" industry bins adjoin the firing floor and tons. A side track built by the street, and connected with the street, allows cars of coal to be unloaded directly into the coal its own track scales and all coal on "our weights."



REAR OF POWER HOUSE.

The Pump Room contains: One Fire Pump of 1,000 gallons per minute capacity. This pump is connected to a complete system of fire mains and is always under steam. It is used during the day to feed the boilers and to operate a water motor which runs the machine shop.



PUMP ROOM.

One Worthington Pressure Pattern Feed Pump, in reserve, of 100 gallons per minute capacity. This is connected to a duplicate boiler feed system.

Two Worthington Jet Condensers, with feed pumps attached. Either condenser will condense 36,000 pounds of steam per hour, and the auxiliary feed pump can feed the same amount of water to the boiler. All of the water used in the operation of the plant is pumped by the above machinery from the Detroit River.

One Wainwright Heater, which utilizes the exhaust steam from the pumps and small engines in heating the boiler feed water.

One Westinghouse Air Compressor, which supplies the compressed air for cleaning machinery.

The Engine Room contains the following:

Arc Lighting Plant:

Five triple expansion, marine type engines; 200 revolutions per minute; 160 pounds steam pressure; 25-inch vacuum; cylinders, 11 $\frac{1}{4}$ -inch, 18 inches and 29 inches in diameter, and 18-inch stroke; horse power at maximum efficiency is 340.

Twenty 50-kilowatt, four-pole Western Electric Co. Arc Dynamos for constant current at 9.6 amperes; speed, 500 revolutions per minute. Four dynamos are driven by each engine, the connection being 7 $\frac{7}{8}$ -inch cotton ropes to each dynamo.

Three 57 $\frac{1}{2}$ -kilowatt, two-pole Western Electric Co. Arc Dynamos for constant current at 9.6 amperes; speed, 465 revolutions per minute. Each dynamo is direct connected to a 100 horse-power, triple expansion Willans center-valve engine.

One 7-kilowatt, two-pole Brush Arc Dynamo; 1080 revolutions; 6 $\frac{1}{2}$ amperes; belt connected to same Westinghouse Compound



DOWN-TOWN POST.

Engine as operates one Westinghouse alternator. This machine furnishes current for a small circuit of enclosed arc lamps.

INCANDESCENT LIGHTING PLANT:

Three Compound Westinghouse engines, run non-condensing; cylinders, 9-inch and 15-inch, with 9-inch stroke; speed, 350 revolutions per minute.

Three 55-kilowatt, two-phase Westinghouse Alternators, belt driven. Alternators are run in parallel; 1100 volts primary, 110 volts secondary.

Two excitors, one belt-driven and one direct-connected to a Westinghouse Standard Engine.

ARC LAMPS:

The 2,067 arc lamps in use are sub-divided as follows:



DOUBLE POST-UNDERGROUND DISTRICT.

1,812	"Brush" double carbon.
12	"Brush" single carbon.
220	"Adams-Bagnall" single carbon.
5	"Adams-Bagnall" enclosed arc.
1	"General Electric" enclosed arc.
1	"Western Electric" enclosed arc.
10	"Western Electric" enclosed arc, alt. current.
6	"General Electric" enclosed arc, alt. current.
2,067	

POLES AND LINES:

The overhead lines of the plant are strung on a total of 6,942 poles, owned as per the table below. On these poles the Commission has strung a total of 421 miles of copper wire.

Public Lighting Commission.....	5,752
Fire Commission.....	544
Police Commission.....	459
Peninsular Electric Lighting Co.	72
Michigan Telephone Co.....	59
Detroit Street Railways.....	35
Edison Illuminating Co.....	5
Detroit Telephone Co.....	16
Total.....	6,942

CENTER SUSPENSION.



"A-B." ARC LAMP.
(Single Carbon.)

The total amount of conduits is as follows:

Size of Line	Length of Line	Ft. of Single Duct
2-duct	210 ft. 2 in.	420 ft. 4 in.
4 "	6,451 " 5 "	25,805 " 8 "
6 "	1,815 " 7 "	10,893 " 6 "
9 "	21,340 " 9 "	192,066 " 9 "
10 "	138 " 1 "	1,380 " 10 "
12 "	95 " 0 "	1,140 " 0 "
15 "	560 " 10 "	8,412 " 6 "
16 "	2,104 " 8 "	33,674 " 8 "
24 "	347 " 2 "	8,332 " 0 "
Tunnel, 6 ft. 2 in. x 3 ft. 6 in.	231 " 0 "	
Tunnel, 5 ft. x 3 ft.	96 " 0 "	
Manholes,	872 " 7 "	
Totals . . .		34,263 ft. 3 in. 282,126 ft. 3 in.

Of lateral conduits constructed of 2½-inch lap-welded iron pipe there are 44,549 feet.

The poles of the Public Lighting Commission are used by other parties as follows:

Fire Commission	891
Police Commission	873
Edison Illuminating Co.....	155
Detroit Electric Light & Power Co.	215
Peninsular Electric Lighting Co..	947
East Side Electric Co.....	78
Detroit Telephone Co.....	856
Michigan Telephone Co.....	118
Detroit Still Alarm Co.....	242
Strubel Brothers.....	9
Parke, Davis & Co.....	1
Detroit Street Railways.....	523
Total.....	4,908

THE UNDERGROUND SERVICE :

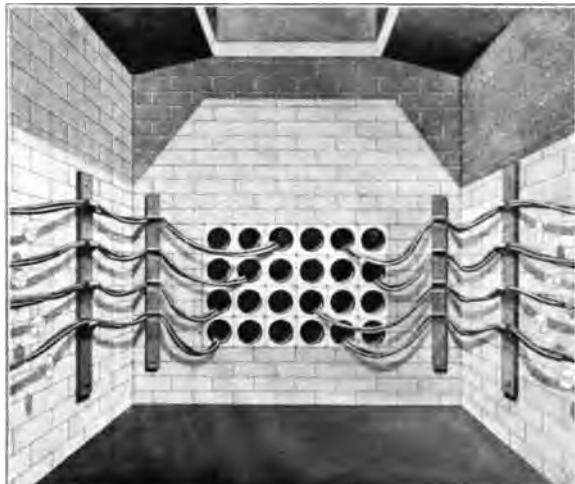
All of the wires of the lighting system within the half mile circle, and a great portion of them inside the mile circle, are underground. The conduits vary in size from 2 ducts to 24 ducts, according to the possible demands upon them. The ducts are a special 3½-inch vitrified clay tile laid in concrete.



"BRUSH" ARC LAMP.
(Double Carbon.)

Of the above conduits in the streets of the city, the Commission has rented the following :

Edison Illuminating Co.	.....	5,331	duct feet.
Strong, Lee & Co.	.....	230	" "
Total.....		5,561	" "



UNDERGROUND MANHOLE.

In the conduits, the following lead covered, rubber insulated cables are used as conductors :

No. 4 B. & S. gauge, in arc lighting circuits.....	118,697 ft.
No. 4 B. & S. gauge, in incandescent feeders	36,576 "
No. 8 B. & S. gauge, in incandescent mains	26,238 "
No. 0 B. & S. gauge, "Duplex" paper, insulated	3,000 "
A total of.....	184,511 "

The rates charged for rental of conduits are as follows :

For single duct, 5c. per foot per annum.

For two ducts paralleling each other, 9c. for the two ducts per foot per annum.

For three ducts paralleling each other, 12c. for the three ducts per foot per annum.

All such rentals are subject to the Rules and Regulations adopted by the Commission May 25th, 1897.

TUNNEL UNDER WOODWARD AVENUE, AT
CAMPUS MARTIUS.

BELLE ISLE PARK:

Belle Isle, the principal city park, an island 700 acres in extent, located at the head of Detroit River and opposite the eastern end of the city, is lighted by the Commission entirely. All the wires are underground, 52,000 feet of 3½-inch wood conduit having been laid for this purpose, nearly one-half of which is still available for pulling in of cables. The bridge to the Island and the more important points on the main roadways are lighted by arc lamps, supported on ornamental iron posts. Fifty-one arc lamps are used and they are operated until 12 midnight as a part of the regular city circuits. Twenty-five thousand feet of No. 4 B. & S. gauge lead covered cable is used for this service.

The buildings in the west end of the park are lighted by incandescent lights, the current for which is obtained from mains connected with the central transformer station, where pairs of transformers receive three-phase alternating current at 3,500 volts and



POST—BELLE ISLE PARK.

deliver two-phase alternating current at 116 volts. The crossing of the Detroit River with the three-phase feeder and the connection to the transformer station is accomplished by the use of 14,500 feet of No. 6 B. & S. gauge three-conductor, lead covered and rubber insulated cable, a part of which is armored with iron wire and placed under the river. The secondary mains connecting the several buildings with the transformer house are made up of 5,800 feet of No. 00 two-conductor and 1,100 feet of No. 1 two-conductor rubber insulated and lead covered cable and 3,000 feet of No. 4 single conductor cable.

The lighting in Water Works Park is done by 14 arc lights. The entire system is underground and was installed by the Water Commission at its own expense, this Commission furnishing the current for operation only.



DOUBLE LAMP POST ON BOULEVARD.

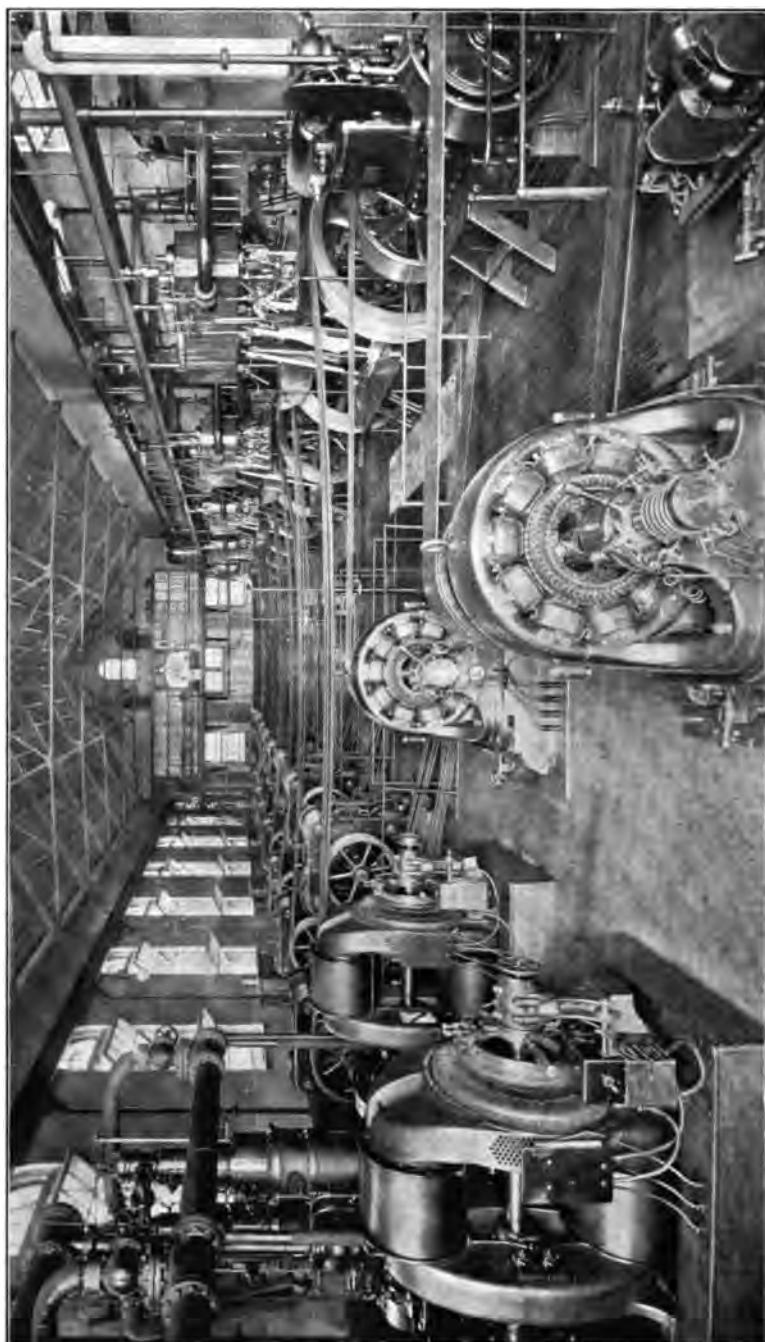
The tower system used by the city in connection with the street lighting is a unique feature. These lights may be seen many miles away by the traveler approaching. The 137 towers in use may be classified as follows:

2	165	feet in height.
1	160	" "
124	150	" "
2	125	" "
8	100	" "

Total, 137



CRANE FIXTURE.



GENERATOR ROOM.

COST OF THE CITY LIGHTING PLANT.

The City's investment proportioned between the incandescent and arc lighting on the basis of the electrical output is as follows:

	Arc.	Incandescent.	Total.
*Conduits	\$ 82,106.97	\$ 8,618.20	\$ 90,725.17
Cables	34,675.92	3,620.55	38,296.47
Real Estate	57,222.81	5,902.19	63,125.00
Buildings and Wharf	99,718.69	10,285.81	110,004.50
Lines and poles	127,931.42	13,403.85	141,335.27
Towers and lamp posts.....	97,536.54	.....	97,536.54
Arc plant	60,890.73	.....	60,890.73
Incandescent plant .....	.....	13,482.16	13,482.16
Steam plant	101,368.38	10,481.49	111,849.87
Railway track and scales.....	9,955.43	1,026.88	10,982.31
Machine shop	7,263.88	750.28	8,014.16
Arc lamps and switches.....	55,663.02	.....	55,663.02
Total	<hr/> \$734,333.79	<hr/> \$67,571.41	<hr/> \$801,905.20
Belle Isle lines, lamps, etc.....	.....	26,182.80	<hr/>
Grand total .....	.....	.....	\$828,088.00

*About one-quarter of these are occupied.

COSTS REDUCED TO A LAMP BASIS.

Reducing the above investment, exclusive of the Belle Isle to the amount per lamp on the basis of the electrical capacity of the plant, viz.: 2,375 arc of 2,000 candle power, and 3,500 incandescent of 16 candle power, and we have the following:

	Arc.	Incandescent.
Conduits, occupied	\$ 8.64	\$0.62
Cables	14.60	1.04
Real estate	24.09	1.69
Buildings and wharf.....	41.98	2.94
Lines and poles.....	53.86	3.83
Towers and lamp posts.....	41.07	....
Arc plant	25.64	....
Incandescent plant .....	....	3.85
Steam plant	42.68	2.99
Railway track and scales.....	4.17	0.29
Machine shop	3.10	0.21
Arc lamps and switches.....	23.43	....
Total	<hr/> \$283.26	<hr/> \$17.46

PUBLIC LIGHTING SYSTEM INVESTMENT.

To June 30, 1900.

The amount expended for investment accounts during the periods specified were as follows:

	Prior to June 30, 1898.	Year 1898.	Year 1899.	Total to June 30, 1900.
Conduits	\$ 83,998.04	\$ 2,560.16	\$ 4,166.97	\$ 90,725.17
Cables	35,922.97	1,264.07	1,109.43	38,296.47
Real estate	63,125.00	.....	.....	63,125.00
Buildings and wharf....	109,945.60	58.90	.....	110,004.50
Lines and poles.....	130,098.90	5,964.58	5,271.79	141,335.27
Towers and lamp posts..	97,034.15	402.80	99.59	97,536.54
Arc plant	58,483.65	2,402.08	5.00	60,890.73
Incandescent plant	13,404.03	.....	78.13	13,482.16
Steam plant	108,239.61	3,607.86	2.40	111,849.87
Railway track and scales.	10,982.31	.....	.....	10,982.31
Machine shop	7,866.71	147.45	.....	8,014.16
Arc lamps and switches..	52,196.76	1,869.83	1,596.43	55,663.02
Belle Isle plant.....	18,848.00	5,380.01	1,954.79	26,182.80
	<hr/>	<hr/>	<hr/>	<hr/>
	\$790,145.73	\$23,657.74	\$14,284.53	\$828,088.00

DEPRECIATION ACCOUNT.

DEBITS.

To investment prior to June 30, 1897.....	\$729,222.73
To investment during year to June 30, 1898.....	60,923.00
To investment during year to June 30, 1899.....	23,657.74
To investment during year to June 30, 1900.....	14,284.53
	<hr/>
Total amount charged to investment.....	\$828,088.00

CONTRA.

(See introductory remarks in annual report of years referred to.)

By amount added to cost of lights for depreciation prior to June 30, 1897.....	\$40,145.73
By amount added to cost of lights for depreciation year ending June 30, 1898.....	22,500.00
By amount added to cost of lights for depreciation year ending June 30, 1899.....	22,534.71
By amount added to cost of lights for depreciation year ending June 30, 1900.....	22,287.22
	<hr/>
Total amount added to cost of lights for depreciation.....	\$107,467.66
	<hr/>
Balance, present investment, June 30, 1900.....	\$720,620.34

ARRANGEMENT OF ARC LAMPS.

The lighting of the city is done exclusively by means of arc lamps of nominal 2,000 candle-power. The lights are placed on towers, posts and center suspensions, as the conditions demand. The 2,002 arc lamps in operation on June 30th, 1900, were distributed in 1,695 locations, as follows:

1,035 cranes	1,035 lamps.
161 center suspensions	161 "
134 posts, single lamps.....	134 "
5 posts, double lamps.....	10 "
203 mast arms	203 "
2 pole tops	2 "
17 indoor work	17 "
*114 three-light towers	342 "
23 four-light towers	92 "
1 six-light tower	6 "
<hr/>	
1,695 locations.	2,002 lamps.

*Twenty-five of these should be four-light towers. On account of the small number of "spare lamps" on hand at the beginning of the general cleaning of arc lamps (June, 1900), twenty-five four-light towers were robbed of one light each.

HOURS OF LIGHTING.

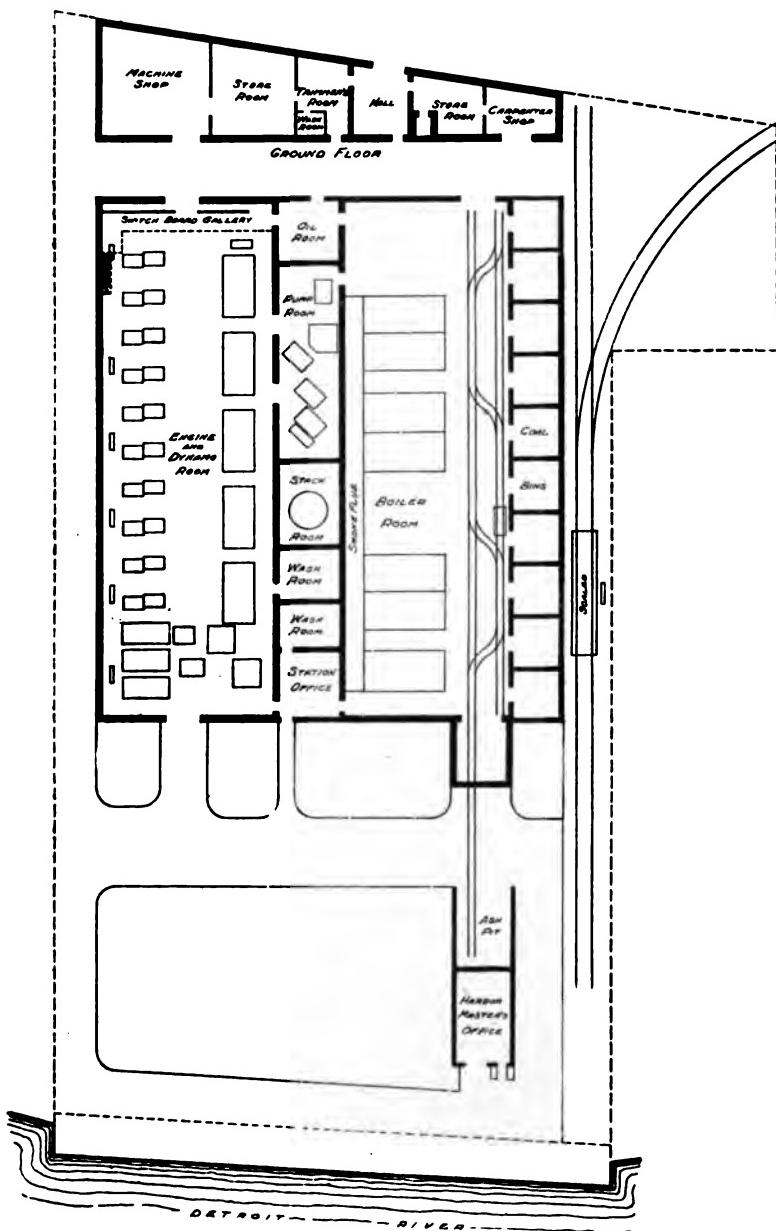
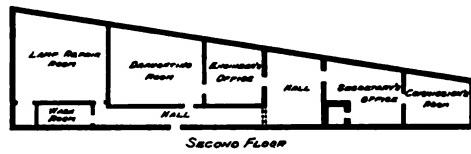
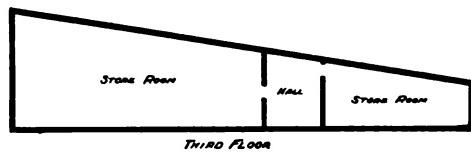
Month.	Total Hrs. Operated.	Av'ge Hrs. Operated.
July	233:05	7:38
August	263:40	8:31
September	298:10	9:56
October	354:00	11:25
November	384:05	12:48
December	414:45	13:23
January	401:10	12:57
February	330:55	11:49
March	326:25	10:31
April	263:20	8:47
May	238:42	7:42
June	208:35	6:57
<hr/>		
	3,716:52	10:12

DISTRIBUTION OF LAMPS BY WARDS.

The total number of arc lamps in service June 30th, 1900, distributed by wards, with comparative size and assessed value of the Wards of the City, are as follows:

Ward.	Acreage.	Total assessed value, 1900.	Lamps.
1.....	1,072.39	\$ 53,929,930.00	195
3.....	736.23	8,564,770.00	108
5.....	636.36	8,170,600.00	93
7.....	666.48	9,252,310.00	113
9.....	875.73	8,784,880.00	104
11.....	646.14	7,078,990.00	102
13.....	1,070.61	7,148,860.00	95
15.....	1,151.54	7,279,410.00	*137
17.....	2,560.00	8,415,810.00	100
 Total East Side.....	 9.415.48	 \$118,617,560.00	 1,047
 2.....	 836.96	 \$ 63,114,190.00	 185
4.....	937.44	15,515,020.00	126
6.....	780.58	10,100,800.00	117
8.....	991.79	8,973,540.00	116
10.....	979.68	8,104,330.00	115
12.....	990.79	6,610,890.00	102
14.....	1,175.36	8,061,620.00	105
16.....	1,456.59	5,273,600.00	89
 Total West Side.....	 8.149.19	 \$125,753,990.00	 955
 Grand Total	 17,564.67	 \$244,371,550.00	 2,002

*Of these 51 are on Belle Isle Park and Bridge.



GROUND PLAN OF PUBLIC LIGHTING STATION.

PUBLIC BUILDINGS LIGHTED.

The public buildings lighted by incandescent lights and the number of 16 candle-power lamps in each, are as follows:

Public Lighting Station and Offices.....	398
City Hall and County Offices.....	*1,602
Public Library	948
Municipal Court Building.....	287
Board of Health Offices.....	53
Water Board Offices.....	132
Police Headquarters, Central Station.....	201
Police Headquarters, East Side.....	100
Police Headquarters, West Side.....	65
Woodbridge Street Police Station.....	28
Police Barns	86
Fire Department Headquarters, Engine House No. 1.....	144
Fire Department, Telegraph Station.....	81
Engine House No. 2.....	24
Engine House No. 3.....	33
Engine House No. 6.....	46
Engine House No. 8.....	32
Engine House No. 9.....	26
Engine House No. 11.....	18
Hook and Ladder House No. 2.....	16
Hook and Ladder House No. 5.....	28
Chemical Engine House No. 2.....	16
Board of Education Offices.....	174
Washington Normal School.....	71
Everett Night School.....	85
Norvell School	112
Capitol Square Fountain.....	23
U. S. S. Yantic.....	43
Water Works Storage Grounds.....	35
House of Correction	750
Belle Isle Park—	5,057
Bath House	100
Bicycle Shelter	125
Boat House	32
Boat Club	160
Casino	190
Dock	55
Park Barn	95
Police Station	48
Skating Pavilion	112
Miscellaneous	41
Yacht Club	64
Total Belle Isle Park.....	1,022
Total lamps	6,679

*This includes 678 lamps used in decorating, and in "Welcome" signs, operated on an average of three nights a week.

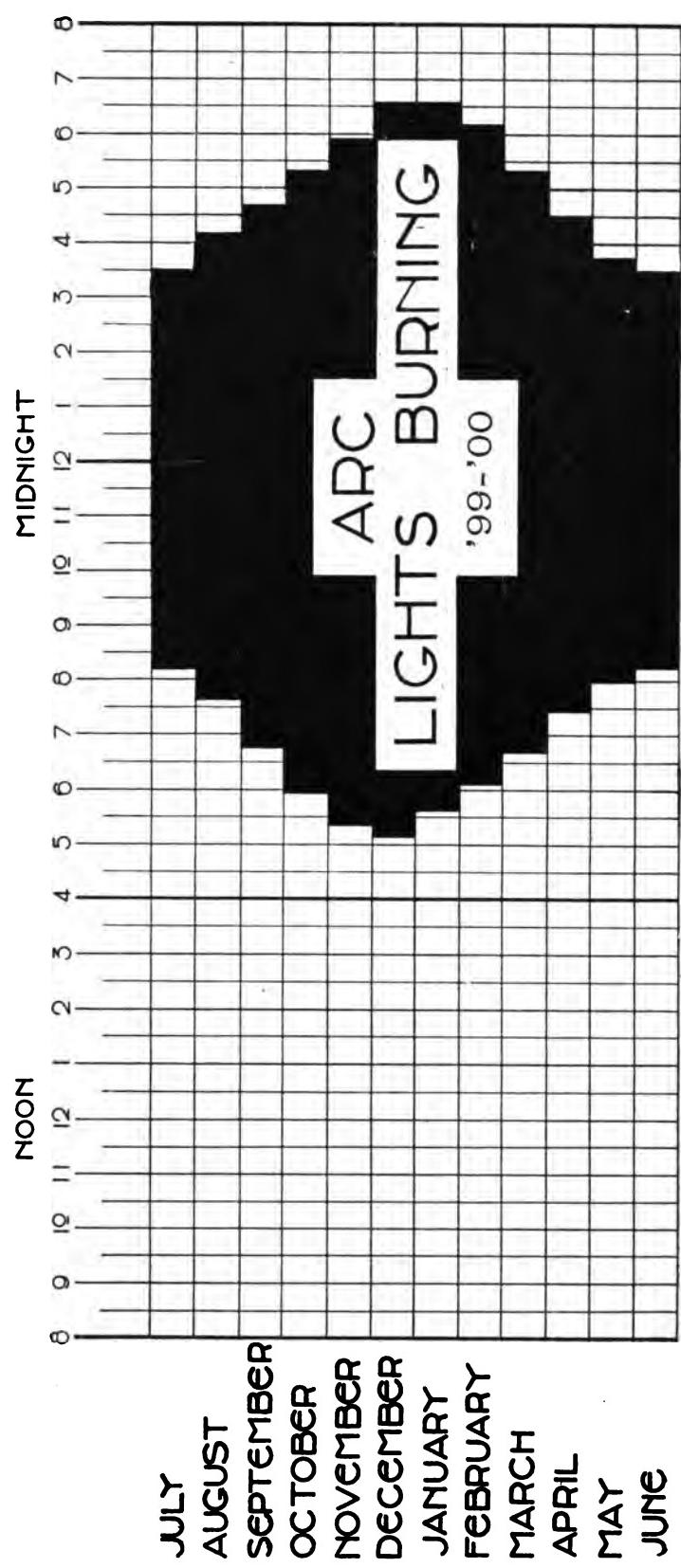


CHART IN BLACK REPRESENTING PERIOD OF ARC LIGHTS BURNING.

LAMPS AND LAMP HOURS OPERATED.

The average number of lamps operated each month, with the total lamp hours scheduled and the lamp hours "Out" during that time, are as follows:

Twelve Months to June 30, 1900.

	Average Number Lamps.	Total Lamp Hours Scheduled.	Total Lamp Hours Out. Hrs. Min.
July	1,938	446,507	127 35
August	1,937	505,193	194 30
September	1,951	576,136	951 37
October	1,950	686,667	1,417 08
November	1,956	749,171	944 31
December	1,963	811,979	592 52
January	1,967	786,041	448 25
February	1,974	651,192	182 12
March	1,978	643,851	462 05
April	1,978	537,681	506 24
May	1,983	470,029	172 17
June	1,977	410,312	139 19
Totals	1,963	7,274,759	6,138 55

The corresponding for the 12 months ending June 30, 1899, is as follows:

Twelve Months to June 30, 1899.

	Average Number Lamps.	Total Lamp Hours Scheduled.	Total Lamp Hours Out. Hrs. Min.
July	1,828	408,595	87 45
August	1,831	478,657	82 48
September	1,820	544,686	247 21
October	1,818	641,515	361 21
November	1,872	719,755	511 00
December	1,878	771,057	2,426 11
January	1,880	761,798	285 17
February	1,881	634,573	183 17
March	1,882	622,061	171 09
April	1,896	510,572	203 52
May	1,915	457,511	241 30
June	1,918	410,670	228 12
Totals	1,868	6,961,450	5,029 43

CAUSES OF LAMP HOURS OUT.

The causes of "Lamp Hours Out" for the year ending June 30, 1900, are summarized as follows:

Month.	Line.	Lamp			Trimmers'			Total.
		Troubles.	Trouble.	Neglect.	Lmps.	Hrs.	Min.	
July,	4	24:27	11	55:54	13	47:14	28	127:35
August,		15	77:58	27	116:32	42	194:30	
September,		130	637:43	96	313:54	226	951:37	
October,	7	37:33	260	1,253:15	23	126:20	290	1,417:08
November,		90	586:08	93	358:23	183	944:31	
December,		42	262:33	97	330:19	139	592:52	
January,	7	24:33	57	295:04	21	128:48	85	448:25
February,		19	110:52	21	71:20	40	182:12	
March,		57	316:49	28	145:16	85	462:05	
April,	12	39:12	81	376:45	29	90:27	122	506:24
May,	12	13:11	33	106:08	23	52:58	68	172:17
June,			23	72:38	27	66:41	50	139:19
<hr/>		Total,	42	138:56	818	4,151:47	498	1,848:12
<hr/>							1,358	6,138:55
1899,	487	2,645:12	200	1,196:52	222	1,197:39	909	5,039:43
1898,	1,479	5,606:13	129	772:01	214	1,087:09	1,822	7,465:23
1897,	108	403:02	56	358:15	88	609:10	242	1,371:07

FIFTH ANNUAL REPORT,
TRIMMING ARC LAMPS.

The work of trimming the lamps is intrusted to the care of a chief trimmer with 17 men. The single carbon Adams-Bagnall lamps are located in the "underground" or business district and are trimmed daily. The Brush double carbon lamps are located in the residence districts and are trimmed every second day, each trimmer having two circuits to care for.

Number of Trimmers.	Number of Route.	Towers.	Poles.	Lamps Trimmed on Cent. Susp.	Total Lamps.	Length of Route in Miles.
1	1	44	44	1	89	4.3
2	2	40	44	1	85	4.5
3	3	6	46	8	60	4.5
3	5	10	38	16	64	4.8
4	4	4	20	38	62	4.8
4	6	22	12	30	64	5.7
5	7	11	41	5	57	6.4
5	9	21	28	5	54	7.0
6	8	7	29	24	60	5.8
6	10	5	22	29	56	5.7
7	11	6	44	5	55	11.0
7	13	21	34	—	55	8.0
8	12	7	34	13	54	6.7
8	14	14	33	13	60	7.2
9	15	0	46	12	58	5.5
9	17	3	34	19	56	6.4
10	16	15	27	19	61	6.8
10	18	10	32	18	60	7.3
11	19	13	37	5	55	6.2
11	21	5	34	16	55	7.0
12	20	17	30	11	58	7.6
12	22	27	27	2	56	8.1
13	23	18	27	12	57	7.3
13	25	—	52	4	56	10.0
14	24	12	34	7	53	7.6
14	26	15	33	9	57	8.1
15	27	9	35	10	54	8.6
15	29	13	42	1	56	10.8
16	28	12	38	5	55	8.5
16	30	23	31	1	55	9.0
17	31	16	26	13	55	6.8
17	32	14	32	12	58	7.0
Totals		440	1,086	364	1,890	225.0
Average					59	7.0
Belle Isle,		8	46		*54	
Enclosed,					13	
Equivalents,					14	
Station Circuit,					31	
						2,002

*Three of these lamps are on the mainland but are trimmed by the Belle Isle Trimmer.

COMPARATIVE KILOWATT HOUR OUTPUT.

Twelve Months to June 30, 1900.

Month.	Arc.	Incan.	Total.
July	205,387	28,114	233,501
August	232,381	30,694	263,075
September	264,991	34,126	299,117
October	315,870	38,194	354,064
November	340,878	43,522	384,400
December	369,451	48,632	418,083
January	357,628	50,104	407,732
February	296,284	42,581	338,865
March	292,947	41,072	334,019
April	244,645	35,308	279,953
May	216,205	35,814	252,019
June	190,786	33,436	224,222
	<hr/> 3,327,453	<hr/> 461,597	<hr/> 3,789,050

Twelve Months to June 30, 1899.

Month.	Arc.	Incan.	Total.
July	187,949	24,170	212,119
August	220,195	26,460	246,655
September	250,570	27,066	277,636
October	295,194	30,232	325,426
November	327,486	32,008	359,494
December	350,848	35,574	386,422
January	346,715	35,440	382,155
February	288,681	30,650	319,331
March	282,998	32,508	315,506
April	232,305	26,750	259,055
May	210,445	29,670	240,115
June	188,907	26,746	215,653
Totals	<hr/> 3,182,293	<hr/> 357,274	<hr/> 3,539,567

COMPARATIVE AMOUNTS OF COAL CONSUMED.

The total amount of coal consumed during the year and the same reduced to the number of pounds per kilowatt hour with comparisons is as follows:

	Year ending June 30, 1900. Lbs. of Coal Consumed.	Lbs. per Kw. Hr.	Year to June 30, '99. Lbs. per Kw. Hr.	Year to June 30, '98. Lbs. per Kw. Hr.	Year to June 30, '97. Lbs. per Kw. Hr.
July	1,200,680	5.14 lbs.	5.79	5.53	5.32
August	1,259,380	4.78 lbs.	5.55	5.40	5.03
September	1,429,350	4.04 lbs.	5.30	4.72	5.10
October	1,278,600	4.27 lbs.	5.21	5.07	4.89
November	1,531,820	3.98 lbs.	4.75	4.96	4.87
December	1,660,670	3.97 lbs.	4.64	4.76	4.82
January	1,592,970	3.90 lbs.	4.75	5.42	4.56
February	1,413,770	4.17 lbs.	4.90	5.10	4.52
March	1,466,680	4.39 lbs.	5.17	5.27	5.10
April	1,280,300	4.57 lbs.	5.41	5.24	5.24
May	1,175,410	4.66 lbs.	5.30	5.57	5.49
June	1,051,440	4.69 lbs.	5.58	5.76	5.80
Totals	16,741,070	4.38 lbs.	5.19	5.23	4.99
Year to June 30, 1899	18,166,430				
Year to June 30, 1898	17,075,525				
Year to June 30, 1897	15,032,230				
Year to June 30, 1896	13,114,531				

COST OF COAL.

The prices paid per ton of 2,000 lbs. for coal, delivered on Public Lighting Commission side track, weights guaranteed, were:

Year ending June 30, 1896—Jackson Hill Lump.....	\$2.19
Year ending June 30, 1897—Jackson Hill Lump.....	2.12
Year ending June 30, 1898—Jackson Hill Lump.....	1.97
Year ending June 30, 1899—Jackson Hill Lump.....	1.97
Year ending June 30, 1900—Pocahontas Smokeless	1.99

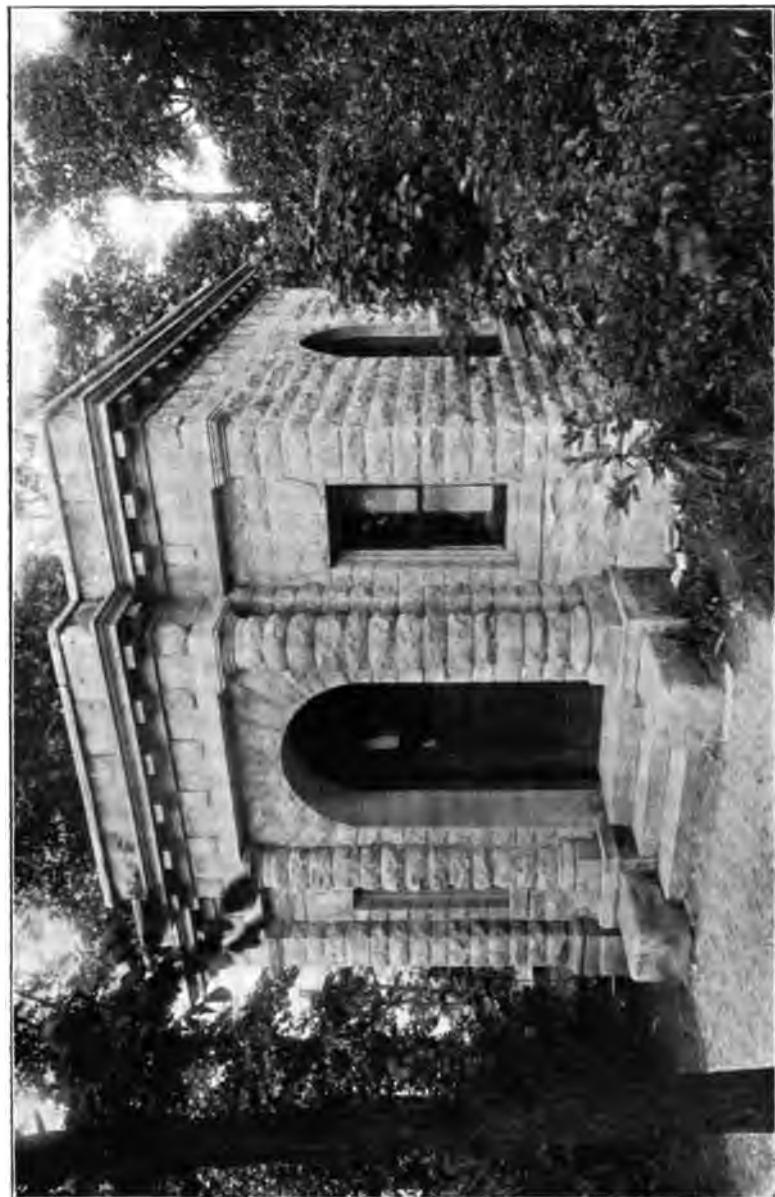
INSIDE WIRING INSPECTION DEPARTMENT.

The work of the department having in charge the inspection of inside electrical wiring and apparatus for the year ending June 30th, 1900, was as follows:

Month of	Number of Applications for and Permits Issued.	Number of Approvals and Certificates Issued.	Amount of Fees Collected.	Expenses.
July	193	207	\$ 271.00	180.82
August	188	174	168.25	186.44
September	332	253	332.00	200.27
October	388	299	269.25	189.32
November	306	296	302.00	200.07
December	256	289	261.00	263.82
January	198	247	196.00	204.07
February	182	184	191.00	181.82
March	223	233	232.95	173.32
April	195	202	190.50	184.32
May	244	225	226.50	169.82
June	241	221	229.75	172.57
Totals	2,946	2,830	\$2,870.20	\$2,306.66

Twelve Months to June 30, 1899.

July	211	209	\$ 257.25	209.50
August	187	206	244.50	179.48
September	231	215	228.00	161.32
October	290	287	289.75	161.32
November	243	241	200.75	162.82
December	172	176	164.75	249.14
January	136	139	147.75	159.32
February	191	192	186.50	159.97
March	242	225	198.75	162.82
April	190	170	167.00	173.57
May	261	241	249.00	201.27
June	256	276	244.25	232.82
Totals	2,610	2,577	\$2,578.25	\$2,213.35



TRANSFORMER HOUSE—BELLE ISLE PARK.

EMPLOYES AND COMPENSATION.

The employes of the Public Lighting Commission on June 30th, 1900, were as follows:

Executive:	Rate per Year.	Rate per day and 7 days per week.	Rate per day and 6 days per week.
1 Secretary	\$1,200.00	....	....
1 General Superintendent	2,000.00	....	....
1 Assistant Gen. Supt.....	1,200.00	....	....
1 Storekeeper	600.00	....	....
1 Superintendent's clerk	480.00	....	....
*1 Stenographer	420.00	....	....
1 Janitor .....	.....	....	\$1.60
*1 Draughtsman .....	.....	....	2.00
—	8		

Inspection Department:

1 Inspector	1,000.00	....	....
1 Permit clerk	900.00	....	....
—	2		

Station:

1 First Engnr. and Machinist .....	.....	\$3.00	....
2 First Engineers, each.....	.....	3.00	....
3 Second Engineers, each...	.....	2.00	....
6 Firemen, each .....	.....	1.75	....
1 Coal passer .....	.....	1.75	....
6 Oilers .....	.....	1.75	....
1 Handy man	720.00	....	....
2 Operating Electricians, each	.....	2.50	....
1 Operating Electrician .....	.....	2.00	....
3 Switch tenders .....	.....	1.50	....
6 Laborers, each .....	.....	1.50	....
—	32		

Lighting:

1 Head Trimmer	900.00	....	....
17 Trimmers, each .....	.....	2.00	....
2 Patrolmen, with horse and buggy .....	.....	3.25	....
1 Belle Isle man.....	780.00	....	....

EMPLOYES AND COMPENSATION—Continued.

Maintenance and Repairs:	Rate per Year.	Rate per day and 7 days per week.	Rate per day and 8 days per week.
1 Blacksmith	\$2.50
1 Blacksmith's helper	2.00
1 Carpenter	2.00
1 Painter	2.00
1 Latheman	2.50
*1 Steamfitter	2.75
1 Dynamo and lamp repairer	2.50
2 Helpers in lamp room, each	2.00
1 Helper in lamp room.....	1.50
1 Apprentice in lamp room..	1.00
1 Conduitman	2.25
1 Conduitman	1.75
1 Conduit helper	1.50
1 Line foreman	3.00
1 Lineman	2.50
2 Linemen, each	2.25
1 Line gang helper.....	1.50
1 Tower foreman	3.00
1 Towerman	2.50
—			
21			

*Temporary employees.

Total employes,	84
Temporary,	3
<hr style="width: 20%; margin-left: 0; border: 0.5px solid black;"/>	

Regular employes,	81
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One day's work consists of 8 hours; proportionate wages for overtime.

Employes paid by the yearly rate are allowed no overtime.

COMPARATIVE CASH COST OF AN ARC LIGHT.

The year's operating expenses can be divided between the Arc and the Incandescent in proportion to the electrical output. That chargeable to Arc Lighting would be \$79,112.87, which amount reduced to the cost of an arc lamp for one year shows the following relative figures:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 4.51	\$ 1.96	\$ 6.47
Executive	3.27	.46	3.73
Station	9.38	8.25	17.63
Trimming	7.33	4.88	12.21
Shop .....	....	.06	.06
Injuries and damages.....	.06	.14	.20
	<hr/>	<hr/>	<hr/>
Totals	\$24.55	\$15.75	\$40.30

The corresponding figures for the twelve months ending June 30, 1899, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 5.87	\$ 2.50	\$ 8.37
Executive	3.56	.37	3.93
Station	10.32	9.51	19.83
Trimming	10.20	3.91	14.11
Shop .....	....	.05	.05
Injuries and damages.....	.03	.14	.17
	<hr/>	<hr/>	<hr/>
Totals	\$29.98	\$16.48	\$46.46

The corresponding figures for the twelve months ending June 30, 1898, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 6.14	\$ 2.34	\$ 8.48
Executive	3.98	.43	4.41
Station	11.44	10.44	21.88
Trimming	11.45	5.09	16.54
Shop .....	.26	.11	.37
Injuries and damages.....	....	.17	.17
	<hr/>	<hr/>	<hr/>
Totals	\$33.27	\$18.58	\$51.85
Twelve months to June 30, 1897....	\$43.57	\$20.62	\$64.19

COMPARISON OF OPERATING DISBURSEMENTS.

The operating disbursements for the year ending June 30, 1900, in the various departments, if partitioned between wages and stores, will show the following division on the basis of each \$100.00 expended:

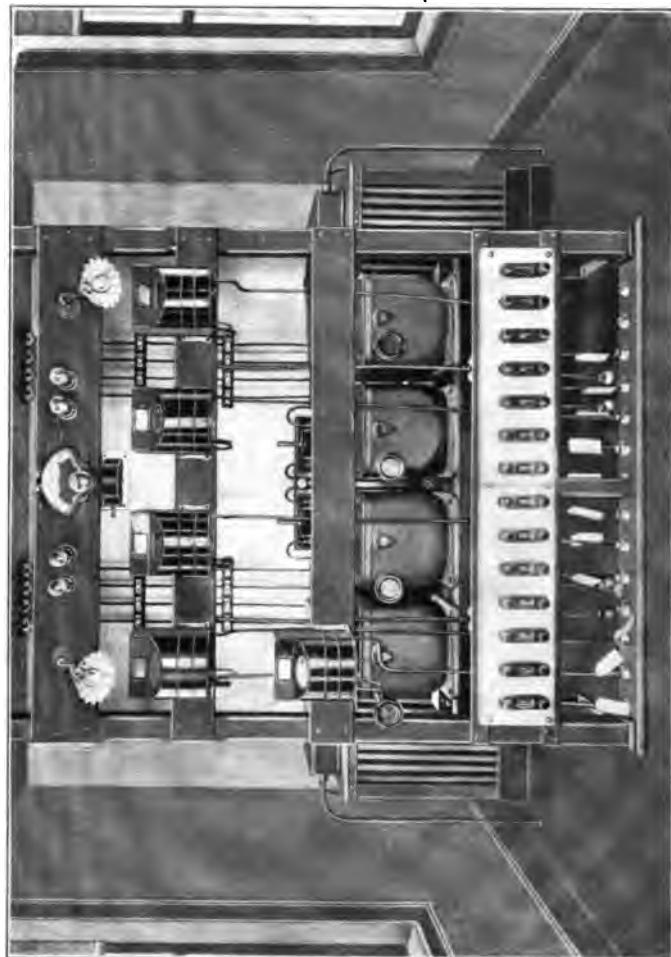
Department.	Wages.	Stores.	Total.
Maintenance	\$11.18	\$ 4.87	\$ 16.05
Executive	8.11	1.13	9.24
Station	23.28	20.47	43.75
Trimming	18.21	12.11	30.32
Shop .....	....	.15	.15
Injuries and damages.....	0.16	.33	.49
 Totals	 \$60.94	 \$39.06	 \$100.00

The corresponding figures for the twelve months ending June 30, 1899, are:

Department.	Wages.	Stores.	Total.
Maintenance	\$12.57	\$ 5.44	\$ 18.01
Executive	7.65	.81	8.46
Station	22.21	20.46	42.67
Trimming	21.95	8.41	30.36
Shop .....	....	.12	.12
Injuries and Damages.....	.06	.32	.38
 Totals	 \$64.44	 \$35.56	 \$100.00

The corresponding figures for the twelve months ending June 30, 1898, are:

Department.	Wages.	Stores.	Total.
Maintenance	\$11.84	\$ 4.51	\$ 16.35
Executive	7.67	.83	8.50
Station	22.07	20.14	42.21
Trimming	22.07	9.83	31.90
Shop .....	.51	.20	.71
Injuries and Damages .....	....	.33	.33
 Totals	 \$64.16	 \$35.84	 \$100.00
Year ending June 30, 1897.....	67.89	32.11	100.00



INTERIOR TRANSFORMER HOUSE—BELLE ISLE PARK.

CASH COST OF OPERATION—July, 1899.

Output, 233,501 K. W. Hours.
July, 1898, 212,119 K. W. Hours.

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....	\$ 40.20	\$ 43.96	\$ 84.76	....
Steam plant	120.05	14.90	134.95	....
Electric plant	31.35	1.00	32.85	....
Miscellane's tools and mach'y	32.08	2.70	34.78	....
Conduits	51.31	....	51.31	....
Towers and lamp posts.....	32.02	.60	32.62	....
Arc lamps	71.06	67.08	138.14	....
Lines and cables.....	283.86	5.84	289.70	....
 Total maintenance	 \$ 663.03	 \$ 136.08	 \$ 799.11	 .00342	
Executive:					
Sec'y and City Elec. Salary..	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	2.75	2.75	....
Store room	50.05	....	50.05	....
Office	49.35	7.70	57.05	....
Engineering and draughting.	116.66	41.55	158.31	....
 Total executive	 \$ 532.72	 \$ 52.00	 \$ 584.72	 .00251	
Station:					
Oils	\$	\$ 84.32	\$ 84.32	.00036	
Waste .....	....	24.86	24.86	.00011	
Coal .....	....	1,134.23	1,134.23	.00486	
Miscellaneous .....	....	96.17	96.17	.00041	
Wages	1,741.81	....	1,741.81	.00746	
 Total station	 \$1,741.81	 \$1,339.58	 \$3,081.39	 .01320	
Lighting:					
Trimming and patrolling....	\$1,237.07	\$ 14.05	\$1,251.12	....
Carbons .....	....	432.11	432.11	....
Incand. lamp renewals.....	....	71.67	71.67	....
Incand. lighting expense....	14.14	3.00	17.14	....
Globes and nets.....	....	55.09	55.09	....
Miscellaneous supplies .....	....	6.31	6.31	....
Belle Isle Park.....	70.87	1.15	72.02	....
 Total lighting	 \$1,322.08	 \$ 533.38	 \$1,905.46	 .00816	
Shop supplies	\$	\$ 33.99	\$ 33.99	.00014	
 Total operating cost.....	 \$4,159.64	 \$2,144.93	 \$6,404.67	 .02743	
July, 1898, was.....	\$5,173.50	\$2,566.39	\$7,739.89	.03689	
July, 1897, was.....	5,952.55	2,525.20	8,477.75	.04522	

CASH COST OF OPERATION—August, 1899.

Output, this month, 263,075 K. W. Hours.

Output, August, 1898, 246,655 K. W. Hours.

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....	\$ 18.46	\$ 1.71	\$ 20.17	....
Steam plant	131.11	35.81	166.92	....
Electric plant	68.94	34.39	103.33	....
Miscel. tools and mach'y.....	50.71	4.80	55.51	....
Conduits	45.10	1.53	46.63	....
Towers and lamp posts.....	123.37	45.00	168.37	....
Arc lamps	48.97	69.18	118.15	....
Lines and cables.....	354.34	85.60	439.94	....
Total maintenance	\$ 841.00	\$ 278.02	\$1,119.02	.00425	
Executive:					
Salary Sec'y and City Elec...	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	187.34	187.34	....
Store room	94.71	0.10	94.81	....
Office	145.00	48.56	193.56	....
Engineering and draughting.	91.66	6.47	98.13	....
Total executive	\$ 648.03	\$ 242.47	\$ 890.50	.00339	
Station:					
Oils	\$	\$ 85.59	\$ 85.59	.00033	
Waste .....	....	18.43	18.43	.00007	
Coal .....	....	1,189.47	1,189.47	.00452	
Miscellaneous .....	....	55.81	55.81	.00021	
Wages	1,757.04	....	1,757.04	.00668	
Total station	\$1,757.04	\$1,349.30	\$3,106.34	.01181	
Lighting:					
Trimn'g arcs and patrolling..	\$1,238.20	\$ 11.70	\$1,249.90	....
Carbons .....	....	471.55	471.55	....
Incand. renewals .....	....	51.21	51.21	....
Incand. lighting expense....	13.16	4.50	17.66	....
Globes and nets.....	....	35.80	35.80	....
Miscellaneous	0.75	10.55	11.30	....
Belle Isle Park.....	66.25	2.02	68.27	....
Total lighting	\$1,318.36	\$ 587.33	\$1,905.69	.00724	
Shop supplies	\$	\$ 8.50	\$ 8.50	....
Surgeon and hospital.....	....	81.15	81.15	.00034	
Total operating cost.....	\$4,564.43	\$2,546.77	\$7,111.20	.02703	
August, 1898, was.....	\$5,223.47	\$2,885.42	\$8,108.89	.03287	
August, 1897, was.....	5,350.85	2,661.68	8,012.53	.03784	

CASH COST OF OPERATION—September, 1899.

Output, this month, 299,117 K. W. Hours.

Output, September, 1898, 277,636 K. W. Hours.

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....	\$ 37.57	\$	\$ 37.57	....
Steam plant	96.60	71.06	167.66	....
Electric plant	88.48	81.78	170.26	....
Miscel. tools and mach'y.....	52.71	54.50	107.21	....
Conduits	59.00	....	59.00	....
Towers and lamp posts.....	75.14	28.50	103.64	....
Arc lamps	163.46	45.67	209.13	....
Lines and cables.....	191.98	75.00	266.98	....
Total maintenance	\$ 764.94	\$ 356.51	\$1,121.45	.00375	
Executive:					
Salary Sec'y and City Elec...	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	16.70	16.70	....
Store room	77.53	2.05	79.58	....
Office	138.12	12.42	150.54	....
Engineering and draughting.	91.66	....	91.66	....
Total executive	\$ 623.97	\$ 31.17	\$ 655.14	.00219	
Station:					
Oils	\$	\$ 85.63	\$ 85.63	.00028	
Waste .....	....	18.07	18.07	.00006	
Coal .....	....	1,270.49	1,270.49	.00425	
Miscellaneous supplies .....	....	45.27	45.27	.00015	
Wages	1,700.20	....	1,700.20	.00569	
Total station	\$1,700.20	\$1,419.46	\$3,119.66	.01043	
Lighting:					
Trim'g arcs and patrolling..	\$1,211.38	\$ 6.01	\$1,217.39	....
Carbons .....	....	615.07	615.07	....
Incand. renewals .....	....	98.11	98.11	....
Incand. lighting expense....	16.74	3.88	20.62	....
Globes and nets.....	....	51.46	51.46	....
Miscellaneous .....	....	56.35	56.35	....
Belle Isle Park.....	75.08	5.05	80.13	....
Total lighting	\$1,303.20	\$ 835.93	\$2,139.13	.00715	
Shop supplies	\$	\$ 5.62	\$ 5.62	....
Surgeon and hospital.....	45.50	27.45	72.95	.00026	
Total operating cost.....	\$4,437.81	\$2,676.14	\$7,113.95	.02378	
September, 1898, was.....	\$5,089.36	\$2,775.18	\$7,864.54	.02833	
September, 1897, was.....	5,363.06	3,012.72	8,375.78	.03459	

CASH COST OF OPERATION--October, 1899.

October, 1899, output, 354,064 K. W. Hours.

October, 1898, output, 325,426 K. W. Hours.

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....	\$ 30.99	\$ 4.66	\$ 35.65	....
Steam plant	88.68	107.02	195.70	....
Electric plant	54.18	81.86	136.04	....
Miscel. tools and mach'y....	42.87	3.75	46.62	....
Conduits	19.13	7.00	26.13	....
Towers and lamp posts.....	76.74	44.18	120.92	....
Arc lamps	242.19	80.86	323.05	....
Lines and cables.....	177.08	74.78	251.86	....
Total maintenance	\$ 731.86	\$ 404.11	\$1,135.97	.00321	
Executive:					
Salary Sec'y and City Elec...	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	81.45	81.45	....
Store room	84.91	....	84.91	....
Office expense	138.40	15.94	154.34	....
Engineering and draughting.	91.66	4.00	95.66	....
Total executive	\$ 631.63	\$ 101.39	\$ 733.02	.00207	
Station:					
Oils	\$	\$ 89.59	\$ 89.59	.00026	
Waste .....	....	17.22	17.22	.00005	
Coal .....	....	1,422.20	1,422.20	.00401	
Miscellaneous .....	....	149.37	149.37	.00042	
Wages	1,787.04	....	1,787.04	.00505	
Total station	\$1,787.04	\$1,678.38	\$3,465.42	.00979	
Lighting:					
Trim'ng arcs and patrolling..	\$1,261.58	\$ 1.50	\$1,263.08	....
Carbons .....	....	773.38	773.38	....
Incand. renewals .....	....	141.54	141.54	....
Incand. lighting expense....	16.53	1.23	17.76	....
Globes and nets.....	....	103.78	103.78	....
Miscellaneous supplies .....	....	29.49	29.49	....
Belle Isle Park.....	65.00	18.85	83.85	....
Total lighting	\$1,343.11	\$1,069.77	\$2,412.88	.00681	
Shop supplies	\$	\$ 0.24	\$ 0.24	....
Surgeon and hospital.....	64.75	7.00	71.75	.00020	
Total operating expense...	\$4,558.39	\$3,260.89	\$7,819.28	.02208	
October, 1898, was.....	\$5,536.87	\$3,244.40	\$8,781.27	.02698	
October, 1897, was.....	5,208.99	3,091.68	8,300.67	.02824	

CASH COST OF OPERATION—November, 1899.

Output, this month, 384,400 K. W. Hours.

Output, November, 1898, 359,494 K. W. Hours.

	Wages.	Stores.	Total.	per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 41.73	\$ 27.60	\$ 69.33	....
Steam plant	65.72	30.45	96.17	....
Electric plant	24.91	15.63	40.54	....
Miscel. tools and mach'y.....	115.14	11.42	126.56	....
Conduits	35.75	14.48	50.23	....
Towers and lamp posts.....	69.76	27.30	97.06	....
Arc lamps	201.90	88.04	289.94	....
Lines and cables.....	336.77	50.20	386.97	....
Total maintenance	\$ 886.68	\$ 265.12	\$1,156.80	.00301
Executive:				
Salary Sec'y and City Elec...	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	15.07	15.07	....
Store	77.75	1.85	79.60	....
Office	140.00	10.31	150.31	....
Engineering and draughting.	91.66	....	91.66	....
Total executive	\$ 626.07	\$ 27.23	\$ 653.30	.00170
Station:				
Oils	\$	\$ 86.25	\$ 86.25	.00022
Waste .....	....	27.35	27.35	.00007
Coal .....	....	1,522.57	1,522.57	.00396
Miscellaneous .....	....	130.08	130.08	.00034
Wages	1,777.91	....	1,777.91	.00463
Total station	\$1,777.91	\$1,766.25	\$3,544.16	.00922
Lighting:				
Trim'ng arcs and patrolling:.	\$1,233.11	\$ 8.00	\$1,241.11	....
Carbons .....	....	887.53	887.53	....
Incand. lamp renewals.....	....	132.17	132.17	....
Incand. lighting expense....	24.58	14.77	39.35	....
Globes and nets.....	....	91.59	91.59	....
Miscellaneous .....	....	12.52	12.52	....
Belle Isle Park.....	78.56	26.63	105.19	....
Total lighting	\$1,336.25	\$1,173.21	\$2,509.46	.00653
Shop supplies	\$	\$ 18.87	\$ 18.87	.00005
Surgeon and hospital.....	38.00	47.25	85.25	.00022
Total operating expense...\$4,669.91		\$3,297.93	\$7,967.84	.02073
November, 1898, was.....\$5,503.55		\$3,323.44	\$8,826.99	.02455
November, 1897, was..... 5,125.03		3,265.06	8,390.09	.02490

CASH COST OF OPERATION—December, 1899.

Output, December, 1899, 418,083 K. W. Hours.

Output, December, 1898, 386,422 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 77.38	\$ 24.83	\$ 102.21	....
Steam plant	112.09	53.89	165.98	....
Electric plant	41.51	8.43	49.94	....
Miscel. tools and mach'y.....	76.06	5.70	81.76	....
Conduits	40.25	....	40.25	....
Towers and lamp posts.....	177.19	25.00	202.19	....
Arc lamps	133.03	62.50	195.53	....
Lines and cables.....	237.15	36.81	273.96	....
Total maintenance	\$ 894.66	\$ 217.16	\$1,111.82	.00266
Executive:				
Salary Sec'y and City Elec...\$	316.66	\$	\$ 316.66	....
Printing and stationery.....	....	50.28	50.28	....
Stores	74.99	1.50	76.49	....
Office	139.80	6.75	146.55	....
Engineering and draughting..	91.66	7.00	98.66	....
Total executive	\$ 623.11	\$ 65.53	\$ 688.64	.00165
Station:				
Oils	\$	\$ 90.70	\$ 90.70	.00021
Waste .....	....	20.62	20.62	.00005
Coal .....	....	1,649.30	1,649.30	.00395
Miscellaneous .....	....	64.92	64.92	.00015
Wages	1,773.05	....	1,773.05	.00424
Total station	\$1,773.05	\$1,825.54	\$3,598.59	.00860
Lighting:				
Trim'ng arcs and patrolling..\$	1,277.12	\$	\$1,277.12	...
Carbons .....	....	785.90	785.90	....
Incand. lamp renewals.....	....	158.71	158.71	....
Incand. lamp expense.....	15.87	45.49	61.36	....
Globes and nets.....	....	66.36	66.36	....
Miscellaneous .....	....	24.01	24.01	....
Belle Isle Park.....	65.00	10.00	75.00	....
Total lighting	\$1,357.99	\$1,090.47	\$2,448.46	.00585
Shop supplies	\$	\$ 21.56	\$ 21.56	.00005
Surgeon and hospital.....	....	14.00	14.00	.00004
Total operating expense...\$	4,648.81	\$3,234.26	\$7,883.07	.01885
December, 1898, was.....\$	5,783.62	\$3,195.68	\$8,979.30	.02323
December, 1897, was..... 5,339.33		3,398.78	8,738.11	.02338

CASH COST OF OPERATION—January, 1900.

Output, this month, 407,732 K. W. hours.

Output, January, 1899, 382,155 K. W. hours.

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 4.22	\$ 27.00	\$ 31.22	....
Steam plant	190.48	82.10	272.58	....
Electric plant	78.59	5.69	84.28	....
Miscel. tools and machinery..	83.24	16.00	99.24	....
Conduits	61.56	....	61.56	....
Towers and lamp posts.....	51.81	27.00	78.81	....
Arc lamps	113.65	29.29	142.94	....
Lines and cables.....	352.02	171.90	523.92	....
 Total maintenance	 \$ 935.57	 \$ 358.98	 \$1,294.55	 .00317
Executive:				
Sal'y Sec'y and City Elec...\$ 316.66			\$ 316.66	....
Printing and stationery.....	....	\$ 16.55	16.55	....
Store room	75.48	2.22	77.70	....
Office	140.20	10.92	151.12	....
Engineering and drafting...	91.66	2.20	93.86	....
 Total executive	 \$ 624.00	 \$ 31.89	 \$ 655.89	 .00161
Station:				
Oils	\$	\$ 90.45	\$ 90.45	.00022
Waste .....	....	19.32	19.32	.00005
Coal .....	....	1,585.01	1,585.01	.00380
Miscellaneous supplies .....	....	136.70	136.70	.00033
Wages	1,783.66	....	1,783.66	.00437
 Total station	 \$1,783.66	 \$1,831.48	 \$3,615.14	 .00886
Lighting:				
Trimming and patrolling...\$1,346.44	\$	\$1,346.44	....
Carbons .....	....	844.61	844.61	....
Incandescent lamp renewals.	....	130.79	130.79	....
Incandescent ltg. expense..	12.97	9.98	22.95	....
Globes and nets.....	....	65.91	65.91	....
Miscellaneous	9.19	56.51	65.70	....
Belle Isle Park.....	65.00	11.00	76.00	....
 Total lighting	 \$1,433.60	 \$1,118.80	 \$2,552.40	 .00626
Shop supplies	\$	\$ 3.06	\$ 3.06	.00001
 Total cost of operation...\$4,776.83	 \$3,344.21	 \$8,121.04	 .01991	
January, 1899, was.....\$5,624.41	\$3,226.30	\$8,850.71	.02316	
January, 1898, was..... 5,462.29	3,634.15	9,096.44	.02517	
January, 1897, was..... 6,318.06	3,407.26	9,725.32	.03022	

CASH COST OF OPERATION—February, 1900.

Output, this month, 338,865 K. W. Hours.

Output, February, 1899, 319,331 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 18.56	\$.35	\$ 18.91	....
Steam plant	116.86	58.23	175.09	....
Electric plant	36.11	2.31	38.42	....
Miscl. tools and machinery.	144.96	10.48	155.44	....
Conduits	50.91	....	50.91	....
Towers and lamp posts.....	14.88	26.10	40.98	....
Arc lamps	119.94	30.04	149.98	....
Lines and cables.....	277.11	72.70	349.81	....
Total maintenance	\$ 779.33	\$ 200.21	\$ 979.54	.00289
Executive:				
Sal'y Sec'y and City Elec...	\$ 316.66	\$	\$ 316.66	....
Printing and stationery.....	....	50.55	50.55	....
Store room	75.49	25.00	100.49	....
Office	138.80	91.68	230.48	....
Superintendence	91.66	9.90	101.56	....
Total executive	\$ 622.61	\$ 177.13	\$ 799.74	.00237
Station:				
Oils	\$	\$ 89.07	\$ 89.07	.00026
Waste .....	....	17.75	17.75	.00005
Coal .....	....	1,406.70	1,406.70	.00416
Miscellaneous .....	....	64.22	64.22	.00019
Wages	1,635.16	....	1,635.16	.00482
Total station	\$1,635.16	\$1,577.74	\$3,212.90	.00948
Lighting:				
Trimming and patrolling...	\$1,218.02	\$	\$1,218.02	....
Carbons .....	....	729.06	729.06	....
Incandescent lamp renewals	....	136.75	136.75	....
Incandescent ltg. expense..	39.54	34.61	74.15	....
Globes and nets.....	....	37.97	37.97	....
Miscellaneous	8.00	9.65	17.65	....
Belle Isle Park.....	66.69	19.47	86.16	....
Total lighting	\$1,332.25	\$ 967.51	\$2,299.76	.00678
Shop supplies	\$	\$ 26.19	\$ 26.19	.00008
Surgeon and hospital.....	1.50	10.00	11.50	.00003
Total operating expense..	\$4,370.85	\$2,958.78	\$7,329.63	.02163
February, 1899, was.....	\$5,249.31	\$2,701.34	\$7,950.65	.02490
February, 1898, was.....	5,152.92	3,166.43	8,319.35	.02731
February, 1897, was.....	6,122.85	2,644.71	8,767.56	.03243

CASH COST OF OPERATION—March, 1900.

Output, March, 1900, 334,019 K. W. Hours.

Output, March, 1899 315,506 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....\$	44.35	\$ 1.80	\$ 46.15	...
Steam plant	148.00	79.31	227.31	....
Electric plant	50.41	39.19	89.60	....
Miscel. tools and machinery..	59.54	5.55	65.09	....
Conduits.....	32.25	....	32.25	....
Towers and lamp posts.....	24.19	25.15	49.34	....
Arc lamps	92.02	24.52	116.54	....
Lines and cables.....	342.39	185.47	527.86	....
Total maintenance	\$ 793.15	\$ 360.99	\$1,154.14	.00345
Executive:				
Sal'y Sec'y and City Elec....\$	316.66	\$	\$ 316.66	....
Printing and stationery.....	....	71.15	71.15	....
Store room	77.00	....	77.00	....
Office	142.00	9.34	151.34	....
Superintendence	121.66	7.03	128.69	....
Total executive	\$ 657.32	\$ 87.52	\$ 744.84	.00223
Station:				
Oils	\$	\$ 88.80	\$ 88.80	.00027
Waste .....	....	19.53	19.53	.00006
Coal .....	....	1,459.35	1,459.35	.00437
Miscellaneous .....	....	117.23	117.23	.00035
Wages	1,847.74	....	1,847.74	.00553
Total station	\$1,847.74	\$1,684.91	\$3,532.65	.01058
Lighting:				
Trimming and patrolling...\$1,341.31	\$	\$1,341.31	....
Carbons .....	....	886.35	886.35	....
Incandescent renewals .....	....	94.66	94.66	....
Incandescent light expense..	57.18	26.93	84.11	....
Globes and nets.....	....	51.74	51.74	....
Miscellaneous .....	....	10.12	10.12	...
Belle Isle Park.....	80.93	10.00	90.93	....
Total lighting	\$1,479.42	\$1,079.80	\$2,559.22	.00766
Shop supplies	\$	\$ 2.06	\$ 2.06	.00001
Surgeon and hospital.....	....	105.00	105.00	.00031
Total operating expense..\$4,777.63	\$3,320.28	\$8,097.91	.02424	
March, 1899, was.....\$5,545.67	\$3,107.43	\$8,653.10	.02742	
March, 1898, was..... 5,678.90	3,444.40	9,123.30	.03030	
March, 1897, was..... 6,221.01	3,241.21	9,462.22	.03541	

CASH COST OF OPERATION—April, 1900.

Output, April, 1900, 279,953 K. W. Hours.

Output, April, 1899, 259,055 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 31.65	\$ 1.91	\$ 33.56	....
Steam plant	308.51	98.50	407.01	....
Electric plant	12.98	4.10	17.08	....
Miscel. tools and machinery..	52.06	36.07	88.13	....
Conduits	43.31	....	43.31	....
Towers and lamp posts.....	50.74	5.59	56.33	....
Arc lamps	135.11	44.49	179.60	....
Lines and cables.....	287.23	64.35	351.58	....
Total maintenance	\$ 921.59	\$ 255.01	\$1,176.60	.00420
Executive:				
Sal'y Sec'y and City Elec...\$	283.32	\$	\$ 283.32	....
Printing and stationery.....	....	32.35	32.35	....
Store room	76.50	....	76.50	....
Office	65.00	10.05	75.05	....
Superintendence ...	106.66	7.20	113.86	....
Total executive	\$ 531.48	\$ 49.60	\$ 581.08	.00208
Station:				
Oils	\$	\$ 93.86	\$ 93.86	.00033
Waste .....	....	24.84	24.84	.00009
Coal .....	....	1,273.90	1,273.90	.00455
Miscellaneous .....	....	37.39	37.39	.00013
Wages	1,638.59	....	1,638.59	.00586
Total station	\$1,638.59	\$1,429.99	\$3,068.58	.01096
Lighting:				
Trimming and patrolling...\$1,268.52	\$	\$1,268.52	....
Carbons .....	....	719.62	719.62	....
Incandescent renewals .....	....	142.15	142.15	....
Incandescent light expense..	14.70	18.59	33.29	....
Globes and nets.....	....	94.79	94.79	....
Miscellaneous .....	....	5.14	5.14	....
Belle Isle Park.....	83.31	6.75	90.06	....
Total lighting	\$1,366.53	\$ 987.04	\$2,353.57	.00841
Shop supplies	\$	\$ 6.14	\$ 6.14	.00002
Surgeon and hospital.....	....	....	....	....
Total operating expense..	\$4,458.19	\$2,727.78	\$7,185.97	.02567
April, 1899, was.....	\$4,898.82	\$2,656.34	\$7,555.16	.02916
April, 1898, was.....	5,174.66	2,798.64	7,973.30	.03198
April, 1897, was.....	6,007.51	2,662.92	8,670.43	.03928

CASH COST OF OPERATION—May, 1900.

Output, May, 1900, 252,019 K. W. Hours.

Output, May, 1899, 240,115 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc....	\$ 55.22	\$ 28.08	\$ 83.30	....
Steam plant	133.46	137.42	270.88	....
Electric plant	16.44	10.95	27.39	....
Miscel. tools and machinery..	25.10	52.08	77.18	....
Conduits	57.79	28.00	85.79	....
Towers and lamp posts.....	120.28	81.50	201.78	....
Arc lamps	117.85	75.09	192.94	....
Lines and cables.....	231.71	290.11	521.82	....
Total maintenance	\$ 757.85	\$ 703.23	\$1,461.08	.00570
Executive:				
Sal'y Sec'y and City Elec...	\$ 266.66	\$	\$ 266.66	....
Printing and stationery.....	....	20.20	20.20	....
Store room	83.50	8.41	91.91	....
Office	65.00	38.84	103.84	....
Superintendence	103.16	6.60	109.76	....
Total executive	\$ 518.32	\$ 74.05	\$ 592.37	.00235
Station:				
Oils	\$	\$ 73.49	\$ 73.49	.00029
Waste .....	....	18.65	18.65	.00007
Coal .....	....	1,169.53	1,169.53	.00464
Miscellaneous .....	....	66.14	66.14	.00026
Wages	1,817.61	....	1,817.61	.00722
Total station	\$1,817.61	\$1,327.81	\$3,145.42	.01248
Lighting:				
Trimming and patrolling...	\$1,324.42	\$	\$1,324.42	....
Carbons .....	....	465.75	465.75	....
Incandescent renewals .....	....	111.45	111.45	....
Incandescent light expense..	10.48	11.82	22.30	....
Globes and nets.....	....	65.23	65.23	....
Miscellaneous .....	....	14.00	14.00	....
Belle Isle Park.....	85.89	29.37	115.26	....
Total lighting	\$1,420.79	\$ 697.62	\$2,118.41	.00841
Shop supplies .....	....	\$ 2.00	\$ 2.00	.00001
Surgeon and hospital.....	....	....	....	....
Total operating expense..	\$4,514.57	\$2,804.71	\$7,319.28	.02004
May, 1899, was.....	\$4,531.61	\$2,553.57	\$7,085.18	.02951
May, 1898, was.....	5,195.46	2,585.75	7,781.21	.03476
May, 1897, was.....	5,658.29	2,377.02	8,035.31	.04102

CASH COST OF OPERATION—June, 1900.

Output, June, 1900, 224,222 K. W. Hours.

Output, June, 1899, 215,653 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K.W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 86.17	\$ 60.88	\$ 147.05	....
Steam plant	66.39	266.01	332.40	....
Electric plant	45.05	44.59	89.64	....
Miscel. tools and machinery..	45.71	4.53	50.24	....
Conduits	88.32	....	88.32	....
Towers and lamp posts.....	231.24	221.39	452.63	....
Arc lamps	219.82	105.73	325.55	....
Lines and cables.....	317.29	147.92	465.21	....
Total maintenance	\$1,099.99	\$ 851.05	\$1,951.04	.00870
Executive:				
Sal'y Sec'y and City Elec...	\$ 266.66	\$	\$ 266.66	....
Printing and stationery.....	....	7.45	7.45	....
Store room	80.25	....	80.25	....
Office	94.25	175.45	269.70	....
Superintendence	95.00	25.61	120.61	....
Total executive	\$ 536.16	\$ 208.51	\$ 744.67	.00332
Station:				
Oils	\$	\$ 67.22	\$ 67.22	.00028
Waste .....	....	19.57	19.57	.00008
Coal .....	....	1,044.84	1,044.84	.00466
Miscellaneous .....	....	74.31	74.31	.00032
Wages	1,708.89	....	1,708.89	.00766
Total station	\$1,708.89	\$1,205.94	\$2,914.83	.01300
Lighting:				
Trimming and patrolling....	\$1,286.69	\$ 150.00	\$1,436.69	..
Carbons .....	....	406.67	406.67	....
Incandescent renewals .....	....	83.74	83.74	....
Incandescent light expense..	17.10	11.51	28.61	....
Globes and nets.....	....	69.19	69.19	....
Miscellaneous	1.88	3.51	5.39	....
Belle Isle Park.....	78.12	....	78.12	....
Total lighting	\$1,383.79	\$ 724.62	\$2,108.41	.00940
Shop supplies	\$	\$ 7.94	\$ 7.94	.00003
Surgeon and hospital.....	....	7.00	7.00	.00003
Total operating expense..	\$4,728.83	\$3,005.06	\$7,733.89	.03449
June, 1899, was.....	\$4,108.93	\$2,160.42	\$6,269.35	.02907
June, 1898, was.....	5,041.76	2,082.89	7,124.65	.03615
June, 1897, was.....	5,592.81	2,452.40	8,045.21	.04567

OPERATING

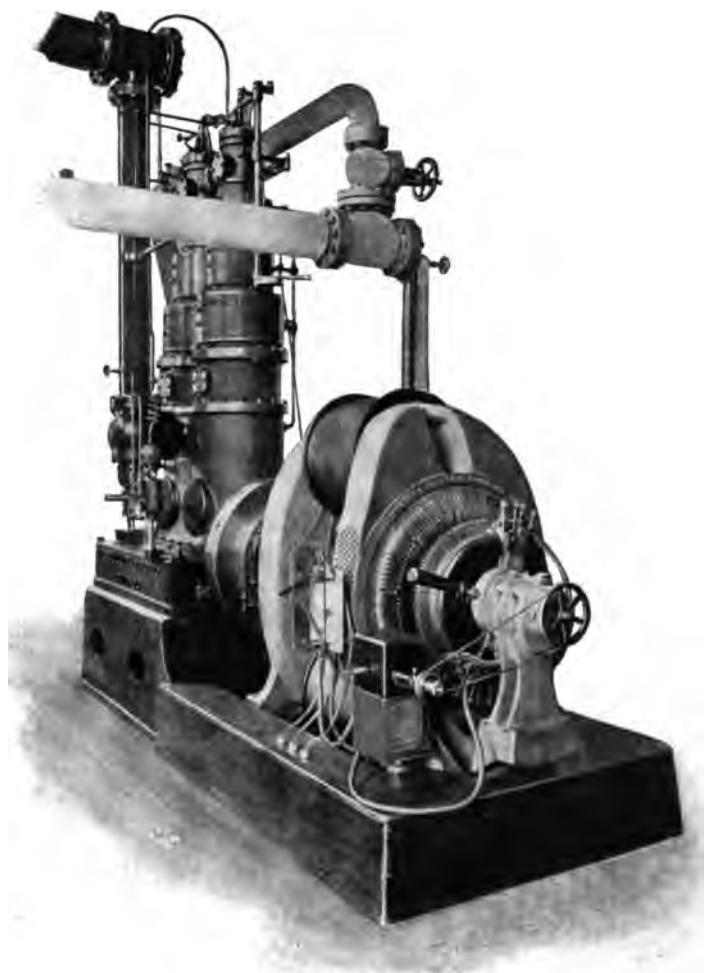
FISCAL YEAR

	First Six Months.		
	Wages.	Stores.	Total.
Maintenance:			
Bldg., track, dock, etc.....	\$ 246.93	\$ 102.76	\$ 349.69
Steam plant	614.25	313.13	927.38
Electric plant	309.87	223.09	532.96
Miscellaneous tools and machinery.....	369.57	82.87	452.44
Conduits	250.54	23.01	273.55
Towers and lamp posts.....	554.22	170.58	724.80
Arc lamps	860.61	413.33	1,273.94
Lines and Cables.....	1,581.18	328.23	1,909.41
 Total maintenance	 \$4,787.17	 \$1,657.00	 \$6,444.17
Executive:			
Salary Secretary and City Electrician...	\$1,899.96	.....	\$1,899.96
Printing and stationery.....	.....	353.59	353.59
Store room	494.94	Cr. 29.50	465.44
Office	846.92	5.43	852.35
Engineering and superintendents.....	574.96	59.02	633.98
 Total executive	 \$3,816.78	 \$ 388.54	 \$4,205.32
Station:			
Oils	\$	\$ 522.08	\$ 522.08
Waste .....	.....	126.55	126.55
Coal .....	.....	8,188.26	8,188.26
Miscellaneous supplies .....	.....	541.62	541.62
Wages	10,537.05	.....	10,537.05
 Total station	 \$10,537.05	 \$9,378.51	 \$19,915.56
Lighting:			
Trimming and patrolling.....	\$7,458.46	\$ 41.26	\$7,499.72
Carbons .....	.....	3,965.54	3,965.54
Incandescent renewal .....	.....	653.41	653.41
Incandescent light expense.....	101.02	72.87	173.89
Globes and nets.....	.....	404.08	404.08
Miscellaneous .....	.75	139.23	139.98
Belle Isle Park.....	420.76	63.70	484.46
 Total lighting	 \$7,980.99	 \$5,340.09	 \$13,321.08
Shop supplies	\$	\$ 88.78	\$ 88.78
Injuries and damages.....	148.25	176.85	325.10
 Total operating expense.....	 \$27,270.24	 \$17,029.77	 \$44,300.01
Year ending June 30, 1899, was.....	\$32,335.55	\$17,965.33	\$50,300.88
Year ending June 30, 1898, was.....	32,303.34	17,991.59	50,294.93
Year ending June 30, 1897, was.....	38,830.29	18,605.04	57,435.33

DISBURSEMENTS.

ENDING JUNE 30, 1900.

Second Six Months.			Total for Twelve Months.		
Wages.	Stores.	Total.	Wages.	Stores.	Total.
\$ 240.17	\$ 120.02	\$ 360.19	\$ 487.10	\$ 222.78	\$ 709.88
963.70	221.57	1,685.27	1,577.95	1,034.70	2,612.65
239.58	106.83	346.41	549.45	329.92	879.37
410.61	124.71	535.32	780.18	207.58	987.76
334.14	28.00	362.14	584.68	51.01	635.69
493.14	386.73	879.87	1,047.36	557.31	1,604.67
798.39	309.16	1,107.55	1,659.00	722.49	2,381.49
1,807.75	932.45	2,740.20	3,388.93	1,260.68	4,649.61
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\$5,287.48	\$2,729.47	\$8,016.95	\$10,074.65	\$4,386.47	\$14,461.12 .00381
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\$1,766.62	\$	\$1,766.62	\$3,666.58	\$	\$3,666.58
.....	198.25	198.25	551.84	551.84
468.22	35.63	503.85	963.16	6.13	969.29
645.25	336.28	981.53	1,492.17	341.71	1,833.88
609.80	58.54	668.34	1,184.76	117.56	1,302.32
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\$3,489.89	\$ 628.70	\$4,118.59	\$7,306.67	\$1,017.24	\$8,323.91 .00219
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\$	\$ 502.89	\$ 502.89	\$	\$1,024.97	\$1,204.97 .00028
.....	119.66	119.66	246.21	246.21 .00006
.....	7,939.33	7,939.33	16,127.59	16,127.59 .00426
.....	495.99	495.99	1,037.61	1,037.61 .00028
10,431.65	10,431.65	20,968.70	20,968.70 .00554
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\$10,431.65	\$9,057.87	\$19,489.52	\$20,968.70	\$18,436.38	\$39,405.08 .01042
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\$7,785.40	\$ 150.00	\$7,935.40	\$15,243.86	\$ 191.26	\$15,435.12
.....	4,052.06	4,052.06	8,017.60	8,017.60
.....	699.54	699.54	1,352.95	1,352.95
151.97	103.44	255.41	252.99	186.31	439.30
.....	384.83	384.83	788.91	788.91
19.07	108.93	128.00	19.82	238.16	257.98
459.94	76.59	536.53	880.70	140.29	1,020.99
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\$8,416.38	\$5,575.39	\$13,991.77	\$16,397.37	\$10,915.48	\$27,312.85 .00721
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\$	\$ 47.39	\$ 47.39	\$	\$ 136.17	\$ 136.17 .00003
1.50	122.00	123.50	149.75	298.85	448.60 .00011
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\$27,626.90	\$18,160.82	\$45,787.72	\$54,897.14	\$35,190.59	\$60,087.73 .02377
\$29,958.75	\$16,405.40	\$46,364.15	\$62,294.30	\$34,370.73	\$96,665.03 .02731
31,705.88	17,991.59	49,418.25	64,009.33	35,703.85	99,713.18 .03038
35,920.53	16,785.52	52,706.05	74,750.82	35,390.56	110,141.38 .03696



DIRECT CONNECTED ARC LIGHTING SET.

COMPARISON OF WAGES PAID IN OPERATING EXPENSES.

For years ending June 30.

Account.

	1900.	1899.	1898.
Maintenance :			
Buildings, track, wharf, etc.....	\$ 487.10	\$ 783.47	\$ 1,010.71
Steam plant	1,577.95	1,212.72	1,551.90
Electric plant	549.45	1,117.89	2,191.46
Miscel. tools, machinery, etc....	780.18	663.03	472.21
Conduits	584.68	463.71	617.81
Towers and lamp posts.....	1,047.36	893.57	1,311.84
Arc lamps	1,659.00	3,508.99	1,752.30
Lines and cables.....	3,388.93	3,512.62	2,912.09
Total maintenance	\$10,074.65	\$12,156.00	\$11,820.32
Executive :			
Salary Secretary and City Electr.	\$ 3,666.58	\$ 3,799.92	\$ 3,799.92
Printing and stationery.....	.....	.....	.....
Store room	963.16	847.81	1,139.98
Clerks and office expense.....	1,492.17	1,562.45	1,410.43
Civil engineer and draughting...	1,184.76	1,179.92	1,206.56
Total executive	\$ 7,306.67	\$ 7,390.10	\$ 7,646.89
Station :			
Oils .....	.....	.....	.....
Waste .....	.....	.....	.....
Coal .....	.....	.....	.....
Miscellaneous supplies .....	.....	.....	.....
Wages	\$20,968.70	\$21,469.63	\$22,004.39
Total station	\$20,968.70	\$21,469.63	\$22,004.39
Lighting :			
Trimming and patrolling.....	\$15,243.86	\$19,763.17	\$20,619.96
Carbons .....	.....	.....	.....
Incand. lamp renewals.....	.....	.....	.....
Incand. lighting expense.....	252.99	296.92	328.64
Globes and nets.....	.....	.....	.....
Miscellaneous	19.82	27.87	175.56
Belle Isle Park.....	880.70	1,128.61	900.00
Total lighting	\$16,397.37	\$21,216.57	\$22,024.16
Shop expense .....	.....	.....	\$ 513.57
Injuries and damages.....	\$ 149.75	\$ 62.00	.....
Total wages paid.....	\$54,897.14	\$62,294.30	\$64,000.33

COMPARISON OF OPERATING EXPENDITURES FOR STORES.

For years ending June 30.

Account.

	1900.	1899.	1898.
Maintenance:			
Buildings, track, wharf, etc.....	\$ 222.78	\$ 356.28	\$ 442.15
Steam plant	1,034.70	1,434.15	779.26
Electric plant	329.92	239.13	849.73
Miscl. tools and machinery.....	207.58	377.32	252.96
Conduits	51.01	55.77	79.98
Towers and lamp posts.....	557.31	52.54	780.54
Arc lamps	722.49	1,201.64	687.72
Lines and cables.....	1,260.68	1,540.76	612.95
Total maintenance	\$ 4,386.47	\$ 5,257.59	\$ 4,485.29
Executive:			
Salary Sec'y and City Electr.....	.....	.....	.....
Printing and stationery.....	\$ 551.84	\$ 517.16	\$ 574.44
Store room	6.13	37.70	5.63
Clerks and office expense.....	341.71	193.68	141.16
Civil engr. and draughting.....	117.56	33.49	102.45
Total executive	\$ 1,017.24	\$ 782.03	\$ 823.68
Station:			
Oils	\$ 1,024.97	\$ 994.99	\$ 1,058.16
Waste	246.21	235.05	212.67
Coal	16,127.59	17,873.34	17,857.72
Miscellaneous	1,037.61	678.97	954.50
Wages .....	.....	.....	.....
Total station	\$18,436.38	\$19,782.35	\$20,083.05
Lighting:			
Trimming and patrolling.....	\$ 191.26	\$ 76.29	\$ 8.75
Carbons	8,017.60	6,295.98	7,765.82
Incand. lamp renewals.....	1,352.95	912.80	956.70
Incand. lighting expense.....	176.31	47.98	124.52
Globes and nets.....	788.91	517.02	460.61
Miscellaneous	248.16	185.25	319.61
Belle Isle Park.....	140.29	93.17	145.30
Total lighting	\$10,915.48	\$ 8,128.49	\$ 9,781.31
Shop expense	\$ 136.17	\$ 122.17	\$ 202.82
Injuries and damages.....	298.85	298.10	327.70
Total supplies used.....	\$35,190.59	\$34,370.73	\$35,703.85

COMPARISON OF TOTAL OPERATING EXPENSES.

For years ending June 30.

Account.	1900.	1899.	1898.
Maintenance:			
Buildings, track, wharf.....	\$ 709.88	\$ 1,139.75	\$ 1,452.86
Steam plant	2,612.65	2,646.87	2,331.16
Electric plant	879.37	1,357.02	3,041.19
Miscl. tools and machinery.....	987.76	1,040.35	725.17
Conduits	635.69	519.48	697.79
Towers and lamp posts.....	1,604.67	946.11	2,092.38
Arc lamps	2,381.49	4,710.63	2,440.02
Lines and cables.....	4,649.61	5,053.38	3,525.04
 Total maintenance	<u>\$14,461.12</u>	<u>\$17,413.59</u>	<u>\$16,305.61</u>
Executive:			
Sal'y Sec'y and City Electr.....	\$ 3,666.58	\$ 3,799.92	\$ 3,799.92
Printing and stationery.....	551.84	517.16	574.44
Store room	969.29	885.51	1,145.61
Clerks and office expense.....	1,833.88	1,756.13	1,551.59
Civil engineering and drafting....	1,302.32	1,213.41	1,399.01
 Total executive	<u>\$ 8,323.91</u>	<u>\$ 8,172.13</u>	<u>\$ 8,470.57</u>
Station:			
Oils	\$ 1,024.97	\$ 994.99	\$ 1,058.16
Waste	246.21	235.05	212.67
Coal	16,127.59	17,873.34	17,857.72
Miscellaneous supplies	1,037.61	678.97	954.50
Wages	20,968.70	21,469.63	22,004.39
 Total station	<u>\$39,405.08</u>	<u>\$41,251.98</u>	<u>\$42,087.44</u>
Lighting:			
Trimming and patrolling.....	\$15,435.12	\$19,839.46	\$20,628.71
Carbons	8,017.60	6,295.98	7,765.82
Incand. lamp renewals.....	1,352.95	912.80	956.70
Incand. lighting expense.....	429.30	344.90	453.16
Globes and nets.....	788.91	517.02	460.61
Miscellaneous	267.98	213.12	495.17
Belle Isle Park.....	1,020.99	1,221.78	1,045.30
 Total lighting	<u>\$27,312.85</u>	<u>\$29,345.06</u>	<u>\$31,805.47</u>
Shop expense	\$ 136.17	\$ 122.17	\$ 716.39
Injuries and damages	448.60	360.10	327.70
 Total operating expenses.....	<u>\$90,087.73</u>	<u>\$96,665.03</u>	<u>\$99,713.18</u>

FINANCIAL STATEMENT.

April 4, 1893, to June 30, 1900.

Covering Existence of the Commission.

Appropriations and Receipts—

From City of Detroit:

Balance of lighting fund of 1893.....	\$ 8,226.29
From contingent fund, 1893.....	25,000.00
From bond issue, 1893.....	600,000.00
From bond issue, 1896.....	50,000.00
From taxes levied prior to 1893.....	4,379.89
From taxes levied 1893.....	175,000.00
From taxes levied 1894.....	174,362.44
From taxes levied 1895.....	158,278.27
From taxes levied 1896.....	150,000.06
From taxes levied 1897.....	204,780.00
From taxes levied 1898.....	79,000.00
From taxes levied 1899.....	136,945.00

Total from City of Detroit..... \$1,765,971.80

From other sources:

From Inspection Department.....	\$ 10,279.45
From work and material supplied other city departments	11,966.38
From sale of old material.....	5,087.25
From rent conduits and poles.....	4,225.34
From lighting public buildings.....	13,969.25
From accounts payable.....	12,461.59
From conscience fund.....	35.00
From decrease in supplies on hand.....	1,471.47

Total from other sources..... \$ 58,024.26

Grand total appropriations and receipts..... \$1,823,996.15

Disbursements—

Investment accounts:

Real estate	\$ 63,125.00
Conduits	90,725.17
Cables	38,296.47
Belle Isle outfit.....	26,182.80
Buildings and wharf.....	110,004.50
Shop machinery, tools, etc.....	8,014.16
Lines and poles.....	141,335.27
Towers and lamp posts.....	97,536.54
Steam plant	111,849.87
Electric plant, arc.....	60,890.73
Electric plant, incandescent.....	13,482.16
Railway track and scales.....	10,982.31
Arc lamps and switches.....	55,663.02

Total amount expended for investment..... \$ 828,088.00

FINANCIAL STATEMENT—Continued.

Operating expenses:

City lighting expense from April 4, 1893, to June 30, 1896:

Office expense	\$ 17,853.51
Advertising	319.16
Public lighting from private companies.....	381,459.72
Fuel	17,162.20
Carbons	8,741.79
Pay rolls	56,178.13
Printing and stationery.....	403.12
General supplies	4,366.37
Oil and rags.....	1,637.85
Teaming	2,192.60
Incandescent lamps	432.42
Globes and nets.....	676.93
	————— \$ 491,423.80
Operating expense 12 months to June 30, 1897..	\$ 110,141.38
Operating expense 12 months to June 30, 1898..	99,713.18
Operating expense 12 months to June 30, 1899..	96,665.03
Operating expense 12 months to June 30, 1900..	90,087.73
Cost of labor and material for other city departments	11,267.06
Inspection department	9,638.86
Increase of stores.....	5,529.03
Work on City Hall tower.....	612.38
Work done for Detroit Boat Club.....	654.08
Accounts receivable	651.48
Taxes charged back, 1893.....	1,487.28
Taxes charged back, 1894.....	2,525.59
Taxes charged back, 1895.....	3,063.44
Taxes charged back, 1896.....	3,421.58
Taxes charged back, 1897.....	12,469.86
	————— \$ 22,967.75
Total disbursements	\$1,767,439.76
Total appropriations and receipts.....	1,823,996.15
	—————
Excess of appropriations and receipts.....	\$ 56,556.39
Balance June 30, 1899:	
City Treasurer	\$ 54,774.76
Secretary	1,781.63
	————— \$ 56,556.39

CASH STATEMENT.

Twelve Months to June 30, 1900.

Receipts—

From taxes year of 1899 (entire appropriation)	\$ 136,945.00
From incandescent lighting for other depts.	1,565.88
From conscience fund moneys.	35.00
From sale of old material.	545.19
From rental of poles, conduits, etc.	2,399.37
From inspection department.	2,817.70
From disallowed voucher, inspection department. .	52.50
From work done other departments.	6,234.89
<hr/>	
Total receipts	\$ 150,595.53

Disbursements—

For 12 months operating expense.	\$ 90,087.73
For 12 months construction expense.	14,284.53
For 12 months inspection department expense. . . .	2,306.66
For 12 months foreign work expense.	3,884.61
For increase in stores on hand.	1,471.47
For decrease in accounts payable.	12,300.12
For work done for Detroit Boat Club.	654.08
<hr/>	
Total disbursements	\$ 124,989.20
<hr/>	
Excess receipts	\$ 25,606.33

Cash balances June 30, 1899, were:

City Treasurer	\$ 30,092.10
Secretary	857.96
	\$ 30,950.06

Cash balances June 30, 1900, should amount to.... \$ 56,556.39

Cash balances June 30, 1900, are:

City Treasurer	\$ 54,774.76
Secretary	1,781.63
	\$ 56,556.39

BALANCE SHEET.

June 30, 1900.

Detroit Boat Club.....	\$ 654.08	
Commercial National Bank.....	651.48	
Will F. Conant		\$ 110.27
Petty cash	1,781.63	
Appropriation balance July 1, 1899.....		150,089.54
City Treasurer, cash.....	54,774.76	
Incandescent lighting		1,565.88
Sale of old material.....		545.19
Conscience fund		35.00
Rentals		2,399.37
Pay rolls	59,970.16	59,970.16
Inspection department, disbursements.....	2,306.66	
Inspection department, receipts.....		2,870.20
Investment accounts:		
Conduits	\$4,166.97	
Belle Isle	1,954.79	
Lines	5,271.79	
Cables	1,109.43	
Towers and lamp posts.....	99.59	
Steam plant	2.40	
Electric plant, arc.....	5.00	
Electric plant, incandescent.....	78.13	
Arc lamps	1,596.43	
		14,284.53

Operating accounts:

Maintenance:

Bldgs., track, dock, etc.....	\$ 709.88	
Steam plant	2,612.65	
Electric plant	879.37	
Miscellaneous tools and machinery..	987.76	
Conduits	635.69	
Towers and lamp posts.....	1,604.67	
Arc lamps	2,381.49	
Lines and cables.....	4,649.61	
		14,461.12

Executive:

Salary Sec'y and City Electr.....	\$3,666.58	
Printing and stationery.....	551.84	
Store room	969.29	
Office	1,833.88	
Engineering and superintendence....	1,302.32	
		8,323.91
Amounts Carried Forward..	\$157,208.33	217,585.61

BALANCE SHEET—Continued.

Amounts Brought Forward.. \$157,208.33 \$217,585.61

Station:

Oils	\$1,024.97
Waste	246.21
Coal	16,127.59
Miscellaneous supplies	1,037.61
Wages	20,968.70
	————— 39,405.08

Lighting:

Trimming arcs and patrolling.....	\$15,435.12
Carbons	8,017.60
Incandescent renewals	1,352.95
Incandescent lighting expense.....	439.30
Globes and nets.....	788.91
Miscellaneous	257.98
Belle Isle Park.....	1,020.99
	————— 27,312.85
Shop supplies	136.17
Surgeon and hospital.....	448.60
Foreign work, disbursements.....	6,131.76
Foreign work, receipts.....	6,234.89

Supplies in stock:

Carbons	\$2,605.29
Coal	1,043.86
Incandescent lamps	813.16
Oils	49.49
Waste	14.59
Globes and nets.....	470.90
Trans. ropes	476.46
Dynamo brushes	55.28
	————— 5,529.03

Accounts payable	12,351.32
	—————
	\$236,171.82 \$236,171.82

BALANCE SHEET.

Books Closed June 30, 1900.

Detroit Boat Club.....	\$ 654.08
Commercial National Bank.....	651.48
Petty cash balance.....	1,781.63
Appropriation balance	\$50,826.26
Cash balance	54,774.76
Will F. Conant.....	110.27
Foreign work balance.....	103.13

Stores on hand:

Waste	14.59
Carbons	2,605.29
Coal	1,043.86
Incandescent lamps	813.16
Oils	49.49
Globes and nets.....	470.90
Trans. ropes	476.46
Dynamo brushes	55.28
Accounts payable	12,351.32
	<hr/>
	\$63,390.98 \$63,390.98

ASSETS AND LIABILITIES.

June 30, 1900.

Assets—

City Treasurer's cash balance.....	\$54,774.76
Secretary's cash balance.....	1,781.63
Accounts receivable	1,305.56
Stores on hand.....	5,529.03
	<hr/>
Total assets	\$ 63,390.98

Liabilities—

Accounts payable	\$ 12,461.59
Excess of assets.....	\$ 50,929.39

Detroit, January 2, 1900.

Hon. C. H. Ritter, President,
Detroit.

Dear Sir:—

This is to certify that the disbursement vouchers of the Commission for the last six months of the year ending December 31, 1899, have been examined by the Auditing Committee and are approved.

Yours very respectfully,

FREDERICK F. INGRAM,
Chairman Auditing Committee.

Detroit, July 16, 1900.

Hon. Frederick F. Ingram,
President Public Lighting Commission,
Detroit.

Dear Sir:—

This is to certify that the disbursement vouchers of the Commission for the last six months of the fiscal year ending June 30, 1900, have been examined by the Auditing Committee and approved.

Yours very respectfully,

JAMES E. DAVIS
E. H. McCURDY,
Auditing Committee.

Office of City Treasurer.

Detroit, July 16, 1900.

Hon. Frederick F. Ingram,
 President Public Lighting Commission,
 Detroit, Mich.

Dear Sir:—

The books of this office show that for the fiscal year ending June 30, 1900, the receipts and disbursements for the account of the Public Lighting Commission have been as follows:

Balance July 1, 1899.....	\$ 30,092.10
Receipts from sundry sources.....	146,443.37
	<hr/>
Total	\$176,535.47
Total vouchers paid.....	\$121,760.71
	<hr/>
Balance June 30, 1900.....	\$ 54,774.76

Yours respectfully,

WM. B. THOMPSON,
 City Treasurer.

Office of the Public Lighting Commission.

STATE OF MICHIGAN, ss.
 County of Wayne,

Arthur S. Guerin, Secretary of the Public Lighting Commission, being duly sworn, says that the accounts of the Public Lighting Commission have been examined and verified by him from April 4th, 1893, to June 30th, 1900, and that the statements published herewith are statements drawn correctly from the books of the Commission.

(Signed) ARTHUR S. GUERIN.

Subscribed and sworn to before me
 this 27th day of July, 1900.

FRANK T. BOWLER,
 Notary Public, Wayne Co., Mich.

Detroit, June 30th, 1900.

Hon. Frederick F. Ingram,
President Public Lighting Commission.

Dear Sir:—

I have examined the books of the Commission for the fiscal year ending this date and find them as follows:

Receipts—

From taxes year of 1899 (entire appropriation).....	\$136,945.00
From incandescent lighting for other departments..	1,565.88
From conscience fund money.....	35.00
From sale of old material.....	545.19
From rental of poles, conduits, etc.....	2,399.37
From inspection department.....	2,817.70
From disallowed vouchers, inspection department..	52.50
From work done other departments.....	6,234.89
<hr/>	
Total receipts	\$150,595.53

Disbursements—

For 12 months' operating expense.....	\$ 90,087.73
For 12 months' construction expense.....	14,284.53
For 12 months' inspection department expense.....	2,306.66
For 12 months' foreign work expense.....	3,884.61
For increase of stores on hand.....	1,471.47
For decrease in accounts payable.....	12,300.12
For work done for Detroit Boat Club.....	654.08
<hr/>	

Total disbursements \$124,989.20

Excess receipts \$ 25,606.33

Cash balances June 30, 1899, were:

City Treasurer	\$ 30,092.10
Secretary	857.96
	<hr/>
	\$ 30,950.06

Cash balance June 30, 1900, should amount to..... \$ 56,556.39

Cash balances June 30, 1900, are:

City Treasurer	\$ 54,774.70
Secretary	1,781.63
	<hr/>
	\$ 56,556.39

I have the honor to be,

Very truly yours,

DR. FRANCIS J. DUCAT,
City Accountant.

ESTIMATE FOR YEAR ENDING JUNE 30, 1901.

Office of Public Lighting Commission,

Detroit, January 30, 1900.

To the Honorable,
 The Controller,
 City of Detroit.

Dear Sir:—

Complying with your request of January 12, 1900, we respectfully submit herewith our estimates of funds that will be required for the fiscal year ending with June 30, 1901.

For Operating and Maintenance—

For an average of 2,000 arc lights at \$45.00.....	\$ 90,000.00
For the incandescent system at 12½% of the arc expense.....	11,250.00

Total	\$101,250.00
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For Extensions and Betterments of the Arc System—

Two engines and arc dynamos, direct connected, complete with foundations, steam piping, switch board connections, etc.....	\$ 13,000.00
Lines and poles for 200 arc lights.....	12,000.00
200 arc lamps and switches.....	4,500.00
Cost of operating 200 additional arc lamps for 9 months at \$45.00 per light per annum.....	6,750.00

Total for extensions.....	\$ 36,250.00
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Grand total	\$137,500.00
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In arriving at the estimated cost price of an arc light for the next fiscal year, the Commission based its figures on the cost of an arc light as per the reports of the Commission for the past 18 months, copies of which will be sent you and to the estimators, together with the increased cost of supplies.

The Commission, after a careful consideration of the city lighting, were unanimous in recommending an addition of 200 arc lights to the system.

Providing no unusual expenses occur, it is estimated that the Commission will have a surplus at the end of the present fiscal year of about \$3,000.00.

We have the honor to be

Yours respectfully,

FREDERICK F. INGRAM,
 HAMILTON CARHARTT,
 JOHN ERHARD,
 JAMES E. DAVIS,
 EDGAR H. McCURDY,
 D. W. SIMONS,
 Commissioners.

Detroit, March 7, 1900.

To the Honorable,
The City Controller,
Detroit, Mich.

Dear Sir:—

At a meeting of this Commission held March 6, 1900, it was the unanimous opinion of the Commissioners that the buildings, machinery and stores of the Board be protected from fire by a proper amount of insurance against loss and that a supplemental estimate be sent to the Board of Estimates to cover the premium on a policy to the amount of \$100,000.00.

This supplemental estimate is, therefore, hereby submitted as follows:

For the premium on a policy amounting to \$100,000.00 protecting the buildings, machinery and stores of the Public Lighting Commission against fire, as follows:

\$25,000 insurance upon buildings, at 80c per \$100.....	\$200.00
\$70,000 insurance upon machinery, both electrical and steam, at 90c per \$100	630.00
\$5,000 insurance upon stores, at 90c per \$100.....	45.00

A total of\$875.00

Very respectfully,

FREDERICK F. INGRAM,
HAMILTON CARHARTT,
JOHN ERHARD,
JAMES E. DAVIS,
EDGAR H. McCURDY,
D. W. SIMONS,
Commissioners.

Detroit, June 28, 1900.

To the Honorable
The Public Lighting Commission.
Gentlemen:—

The Board of Estimates of the City of Detroit, after considering the estimates submitted by the Public Lighting Commission for the operation and maintenance of the present plant for the fiscal year ending June 30, 1901, and for the improvements and extensions of the Public Lighting System, granted the following:

For operation and maintenance of the present plant:

2,000 arc lights, at \$42.50 each.....	\$ 85,000.00
For the incandescent system.....	11,000.00

Total appropriation\$ 96,000.00

Respectfully yours,

F. A. BLADES.
City Controller.

APPENDIX.

Public Lighting Act.

AN ACT to amend an act, entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, by adding a new chapter thereto.

Section 1. The People of the State of Michigan enact, That an act entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, be and the same is hereby amended by adding a new chapter thereto to be known as chapter thirteen, to read as follows:

CHAPTER XIII.

Section 1. There shall be a board of commissioners in said city known as the public lighting commission. Said commission shall consist of six members, who shall be appointed by the mayor and approved by the common council. The first appointment of members of this commission shall be made at the next meeting of the common council after this chapter shall have become operative, and the first appointments shall be made for the terms respectively of one, two, three, four, five and six years, and the members so appointed shall hold office until their successors are appointed and shall have qualified. Their successors shall be appointed at the termination of said respective terms for the term of six years. Said commissioners shall take and file in the office of the city clerk the oath of office prescribed for city officers, and shall then enter upon the performance of their duties. They shall appoint their president and secretary, who shall perform the duties usually appertaining to such offices and such as shall be prescribed by said board. The president of said board shall be ex-officio a member of the board of estimates. Said board of commissioners shall have authority to call upon the city surveyor for any services they may require in making maps or diagrams of locations of lights and wires within the city limits, and the city clerk and board of public works shall furnish them such information as they may require for the proper discharge of their duties.

Sec. 2. The said city may contract for the lighting of public buildings, streets, avenues, parks, public grounds and places for any period not exceeding three years. It shall have power to procure lands, and purchase or construct the necessary buildings, engines, dynamos, and other machinery, tools, lamps, lines, conduits, poles, towers and other apparatus and appliances, constituting a plant for lighting the said city by electricity, or by any other means or system, and if the common council deem it desirable it may purchase towers, poles, wires, lamps and other appliances, and cause lines of wire to be constructed, the use of which it may let to any persons or corporation contracting to light said city. It shall also have power to lay pipes and conduits in the highways, alleys and public places, for gas or electric light wires, and to erect in the highways, alleys and public places, poles, towers, or posts for wires or lamps, and to place, construct and maintain the necessary lines of wires, either below or above ground, in the highways, alleys or public places: Provided, That nothing in this act shall be construed as granting said municipality or said board the right to engage in the business of private or commercial lighting.

Sec. 3. If the common council shall determine to contract for lighting, it shall by resolution direct the public lighting commissioners to enter into a contract for lighting said city, either by electricity or by such other means as it may determine, for a period of time to be mentioned in such resolution. It shall thereupon be the duty of said commissioners to prepare specifications and advertise for proposals for a period of not less than five days, and enter into a contract in behalf of said city with the lowest responsible bidder, for lighting said city by such means as are specified in such resolution: Provided, It shall be competent for the commissioners to contract for lighting the public buildings and any part or portion of the city by different means or systems.

Sec. 4. If the common council shall determine that it is advisable to establish a plant for public lighting, to be owned by the city, it may direct said commissioners to purchase the necessary lands, machinery, wires, poles, lamps, towers and other apparatus and appliances mentioned in the second section of this chapter, the cost of which shall not exceed eight hundred thousand dollars. And it shall thereupon be the duties of said commissioners without further approval or confirmation of their contracts by the common council, to carry into effect the authority thereby conferred, and to make the necessary purchase of lands, machinery, engines, tools, lamps, apparatus and appliances, and construct the buildings required, and cause to be constructed or laid all necessary conduits and lines of wire below ground, and to erect and construct all necessary poles, towers, posts, lines of wire above ground, which they shall deem necessary or required according to such system or systems as they may deem best for the lighting of said city. (As amended January 17, 1895.)

Sec. 5. The said commissioners may employ an electrical engineer who shall be known as the city electrician, and such other superintendents, engineers, clerks, agents and subordinates under them as may be necessary to carry into effect the provisions of this chapter, regulate and define their duties and prescribe their compensation.

Before the common council shall direct said commissioners to establish a plant as herein provided, it shall by resolution submit to the electors of said city, to be voted upon by said electors, the question as to whether the authority hereby conferred shall be exercised. The proposition shall be stated upon the ballots to be printed by the election commissioners, in the following form: "For a city lighting plant—Yes." and the same words repeated followed by the word "No;" and any elector may vote for or against said proposition by marking a cross opposite said words "Yes" or "No," respectively. The votes upon said proposition and for and against the same, respectively, shall be certified, returned and canvassed by the board of city canvassers in the manner now provided by law for certifying, returning and canvassing votes cast for city officers. And if a majority of the electors voting thereon in said city shall vote in favor of said proposition then the authority hereby conferred may be exercised; otherwise the same shall not be so exercised. Notice shall be given by the city clerk by publication in four or more newspapers of the election to vote upon said proposition at least five days before the election.

Sec. 6. The said commissioners shall have a general supervision and management of all public lighting, and of any plant established by the city, as herein provided for that purpose, and all employes engaged in or about the construction or operation thereof, and shall make the necessary purchase of fuel, tools, supplies, materials, apparatus and appliances required in the operation and management of said plant, without further approval or confirmation of their contracts by the common council: Provided, That the expenditures for the operation and management of said plant shall not exceed in any one year the tax levied for that purpose: And provided further. That after the adoption by them of plans and specifications for the erection of any buildings, the board of public works shall have the immediate supervision or superintendence of construction thereof, and also of the laying of conduits in the public streets, and of the necessary excavation, refilling and repaving caused thereby. (As amended January 17, 1895.)

Sec. 7. The said city may raise by tax the necessary funds to provide for the public lighting and for the purpose of providing for the construction of the public lighting plant, as herein provided, may raise moneys by tax or issue the bonds of said city, payable at such times and in such amount and at such rates of interest as the common council may determine, subject, however, to the approval of the board of estimates as provided by section 4, chapter 8, of act number 488 of the public acts of 1887. It shall also have power to issue bonds in like manner or raise moneys by tax for the purchase or construction of conduits, wires, posts, poles, towers and lamps, for use by any party or parties contracting for the public lighting as herein provided.

Sec. 8. No contract shall be let nor any purchase be made of any lands or property requiring the payment of any money, nor shall any moneys be paid for public lighting in excess of the tax levied for that purpose or of moneys raised by issuing bonds as herein provided.

Sec. 9. The public lighting commissioners shall have the supervision of the construction of all the electric lighting lines of wires in said city whether owned by the

city or by other parties, and of all connections made with any building or buildings, and no such wires or lines of wire shall be placed, laid, erected or constructed, nor shall any pole or post or conduit be laid, placed or constructed for such lines, nor any connection made with any building or buildings, except under such general regulations as they from time to time may adopt. They may prescribe the limits of the district or districts in said city, within which it shall not be lawful to erect poles and train wires for such lines above ground in any street or highway, and they may prescribe or determine the other street or streets in which it may be lawful to erect or construct such lines of wire above ground. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor and shall be punished accordingly.

Sec. 10. The common council shall have power to adopt ordinances not in conflict herewith, to carry out the provisions of this chapter and to regulate the use of electricity for lighting purposes in said city, and the training or using of wires therefor, and to regulate or prohibit the erection of poles in the streets of said city for such wires, or the training thereof.

Sec. 11. Any person who shall cut, break, injure or destroy any building, engine, dynamo or other machinery, or appliances, poles, posts, towers, lamps, wires or conduits erected, constructed or used for the public lighting of said city, whether owned by the corporation or by any party or parties contracting for the lighting of said city, with intent to prevent or interrupt the lighting of any public building, or any part or portion of said city, shall be deemed guilty of a misdemeanor, and shall be punished therefor by a fine or not less than twenty-five dollars nor more than one thousand dollars, or by imprisonment not exceeding two years, or by both fine and imprisonment in the discretion of the court, and proof that the act was willful shall be prima facie evidence of such intent.

This act is ordered to take immediate effect.

Approved March 18th, 1893.

General Lighting Ordinance.

A GENERAL ORDINANCE authorizing the granting of permission to construct, maintain and operate poles, conduits, wires or other conductors for the purpose of furnishing electric lighting in the City of Detroit.

It is hereby ordained by the people of the City of Detroit:

Section 1. That any person or corporation carrying on a manufacturing business in the City of Detroit, and having surplus power applicable to the purpose, may apply to and receive a permit from the Public lighting Commission to lay conduits, erect poles and place thereon or therein wires or other conductors for the purpose of furnishing electric lighting to any person or persons desiring the same, and within the district to be designated in the application to be made for such permit. Said Public Lighting Commission is hereby authorized to grant such permits for the laying of conduits, erection of poles, placing of wires or conductors thereon in the streets, alleys or other highways of the city; subject, however, to the conditions and restrictions imposed by this ordinance, and all other general ordinances now in force or which may hereafter be adopted concerning the same.

Sec. 2. The person or corporation to whom such permit shall be granted shall do no injury to any street, avenue, alley, lane, park or public square, or to any shade trees, or in any manner disturb or interfere with any water or gas pipes, or with any public or private sewer now or hereafter laid or constructed by any authorized person, persons or corporations, or the wires and conduits of any telephone, telegraph or electric lighting or street railway company, or of the police, fire or lighting commission, and shall fully indemnify and save harmless the City of Detroit from any and all claims or damages for which said city might be made or become liable to pay by reason of the construction, maintaining, repairing or operating of said poles, conduits, wires, lamps or other conductors, or any apparatus connected therewith: or

Sec. 4. If the common council shall determine that it is advisable to establish a plant for public lighting, to be owned by the city, it may direct said commissioners to purchase the necessary lands, machinery, wires, poles, lamps, towers and other apparatus and appliances mentioned in the second section of this chapter, the cost of which shall not exceed eight hundred thousand dollars. And it shall thereupon be the duties of said commissioners without further approval or confirmation of their contracts by the common council, to carry into effect the authority thereby conferred, and to make the necessary purchase of lands, machinery, engines, tools, lamps, apparatus and appliances, and construct the buildings required, and cause to be constructed or laid all necessary conduits and lines of wire below ground, and to erect and construct all necessary poles, towers, posts, lines of wire above ground, which they shall deem necessary or required according to such system or systems as they may deem best for the lighting of said city. (As amended January 17, 1895.)

Sec. 5. The said commissioners may employ an electrical engineer who shall be known as the city electrician, and such other superintendents, engineers, clerks, agents and subordinates under them as may be necessary to carry into effect the provisions of this chapter, regulate and define their duties and prescribe their compensation.

Before the common council shall direct said commissioners to establish a plant as herein provided, it shall by resolution submit to the electors of said city, to be voted upon by said electors, the question as to whether the authority hereby conferred shall be exercised. The proposition shall be stated upon the ballots to be printed by the election commissioners, in the following form: "For a city lighting plant—Yes," and the same words repeated followed by the word "No;" and any elector may vote for or against said proposition by marking a cross opposite said words "Yes" or "No," respectively. The votes upon said proposition and for and against the same, respectively, shall be certified, returned and canvassed by the board of city canvassers in the manner now provided by law for certifying, returning and canvassing votes cast for city officers. And if a majority of the electors voting thereon in said city shall vote in favor of said proposition then the authority hereby conferred may be exercised; otherwise the same shall not be so exercised. Notice shall be given by the city clerk by publication in four or more newspapers of the election to vote upon said proposition at least five days before the election.

Sec. 6. The said commissioners shall have a general supervision and management of all public lighting, and of any plant established by the city, as herein provided for that purpose, and all employes engaged in or about the construction or operation thereof, and shall make the necessary purchase of fuel, tools, supplies, materials, apparatus and appliances required in the operation and management of said plant, without further approval or confirmation of their contracts by the common council: Provided, That the expenditures for the operation and management of said plant shall not exceed in any one year the tax levied for that purpose: And provided further. That after the adoption by them of plans and specifications for the erection of any buildings, the board of public works shall have the immediate supervision or superintendence of construction thereof, and also of the laying of conduits in the public streets, and of the necessary excavation, refilling and repaving caused thereby. (As amended January 17, 1895.)

Sec. 7. The said city may raise by tax the necessary funds to provide for the public lighting and for the purpose of providing for the construction of the public lighting plant, as herein provided, may raise moneys by tax or issue the bonds of said city, payable at such times and in such amount and at such rates of interest as the common council may determine, subject, however, to the approval of the board of estimates as provided by section 4, chapter 8, of act number 488 of the public acts of 1887. It shall also have power to issue bonds in like manner or raise moneys by tax for the purchase or construction of conduits, wires, posts, poles, towers and lamps, for use by any party or parties contracting for the public lighting as herein provided.

Sec. 8. No contract shall be let nor any purchase be made of any lands or property requiring the payment of any money, nor shall any moneys be paid for public lighting in excess of the tax levied for that purpose or of moneys raised by issuing bonds as herein provided.

Sec. 9. The public lighting commissioners shall have the supervision of the construction of all the electric lighting lines of wires in said city whether owned by the

city or by other parties, and of all connections made with any building or buildings, and no such wires or lines of wire shall be placed, laid, erected or constructed, nor shall any pole or post or conduit be laid, placed or constructed for such lines, nor any connection made with any building or buildings, except under such general regulations as they from time to time may adopt. They may prescribe the limits of the district or districts in said city, within which it shall not be lawful to erect poles and train wires for such lines above ground in any street or highway, and they may prescribe or determine the other street or streets in which it may be lawful to erect or construct such lines of wire above ground. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor and shall be punished accordingly.

Sec. 10. The common council shall have power to adopt ordinances not in conflict herewith, to carry out the provisions of this chapter and to regulate the use of electricity for lighting purposes in said city, and the training or using of wires therefor, and to regulate or prohibit the erection of poles in the streets of said city for such wires, or the training thereof.

Sec. 11. Any person who shall cut, break, injure or destroy any building, engine, dynamo or other machinery, or appliances, poles, posts, towers, lamps, wires or conduits erected, constructed or used for the public lighting of said city, whether owned by the corporation or by any party or parties contracting for the lighting of said city, with intent to prevent or interrupt the lighting of any public building, or any part or portion of said city, shall be deemed guilty of a misdemeanor, and shall be punished therefor by a fine or not less than twenty-five dollars nor more than one thousand dollars, or by imprisonment not exceeding two years, or by both fine and imprisonment in the discretion of the court, and proof that the act was willful shall be prima facie evidence of such intent.

This act is ordered to take immediate effect.

Approved March 18th, 1893.

General Lighting Ordinance.

A GENERAL ORDINANCE authorizing the granting of permission to construct, maintain and operate poles, conduits, wires or other conductors for the purpose of furnishing electric lighting in the City of Detroit.

It is hereby ordained by the people of the City of Detroit:

Section 1. That any person or corporation carrying on a manufacturing business in the City of Detroit, and having surplus power applicable to the purpose, may apply to and receive a permit from the Public lighting Commission to lay conduits, erect poles and place thereon or therein wires or other conductors for the purpose of furnishing electric lighting to any person or persons desiring the same, and within the district to be designated in the application to be made for such permit. Said Public Lighting Commission is hereby authorized to grant such permits for the laying of conduits, erection of poles, placing of wires or conductors thereon in the streets, alleys or other highways of the city; subject, however, to the conditions and restrictions imposed by this ordinance, and all other general ordinances now in force or which may hereafter be adopted concerning the same.

Sec. 2. The person or corporation to whom such permit shall be granted shall do no injury to any street, avenue, alley, lane, park or public square, or to any shade trees, or in any manner disturb or interfere with any water or gas pipes, or with any public or private sewer now or hereafter laid or constructed by any authorized person, persons or corporations, or the wires and conduits of any telephone, telegraph or electric lighting or street railway company, or of the police, fire or lighting commission, and shall fully indemnify and save harmless the City of Detroit from any and all claims or damages for which said city might be made or become liable to pay by reason of the construction, maintaining, repairing or operating of said poles, conduits, wires, lamps or other conductors, or any apparatus connected therewith: or

otherwise arising from the use or possession of the rights and privilege granted, or from any neglect on the part of said corporation or person or its or his employees to comply with any of the ordinances of the City of Detroit, and especially shall indemnify the city against and assume all liability and damages which may arise, come or occur to the City of Detroit from any injury to persons or property from the doing of any work herein mentioned, or the neglect of any person or company or its employees to comply with any ordinance relative to the use of streets, or other public places, especially as to the putting up of lights or barriers at or around excavations, and the acceptance by the person, persons or corporation of such permit of this ordinance shall be an agreement by it to pay to the City of Detroit any sum of money for which the city may become liable from or by reason of such injury.

Sec. 3. All poles erected under such permit shall be firmly set in the ground next to and within the curbstone, so as to cause the least obstruction, in such manner and of such uniform height, size, color and material as shall be approved or designated by the Public Lighting Commission and Board of Public Works.

Sec. 4. All operating and conducting mains and wires of any such person, persons or corporation shall be thoroughly and securely insulated with a material of sufficient thickness and durability to protect them from abrasion and other mechanical injury, and impervious to water, to be approved by the Public Lighting Commission, and when laid beneath the surface of the ground, all conduits shall be laid in streets and avenues in a line parallel with the curb line thereof, at such distance from the curbstone, or where the curbstone should be as shall be designated by the Board of Public Works, and to a depth not exceeding two feet. It is especially required that all service wire used by such person, persons or corporation shall be connected only with a main laid in a conduit in the alley or at the side of the street nearest to the building into which it is desired to conduct such service wires.

Sec. 5. At least twenty-four hours before opening or excavating in any street, alley or any public space for the above or for any other purpose, said person, persons or corporation shall notify the Board of Public Works in writing of such desire, stating the place where and the object for which said opening is to be made, and obtain the permit of said board, and in the opening and refilling of all openings and excavations made as aforesaid, the relaying of the pavements and other work necessary to the complete restoration of the streets, pavements, sidewalks or ground to equally good condition as when disturbed, the said person, persons or company or its servants or employees shall be under the supervision of the Board of Public Works or its authorized agents, and shall promptly comply with any order or resolution of said board or its agents, or of the Common Council, in reference thereto. Nor shall any street, avenue or public space be allowed to remain open or incumbered for a longer period than shall be necessary to execute the work for which the same has been opened. And the Board of Public Works or the Common Council may determine the question of such necessity.

The earth removed in making such excavation shall be restored and the pavement be relaid by said person or corporation in as good a condition as before the making of such excavation, and thereafter be maintained in as good condition as the surrounding pavement until the street or alley in each case is repaved. No excavation in any street, alley or public place shall be allowed to remain open or said street, alley or public place be encumbered for a longer period than shall be necessary to execute the work for which the same is made.

The cost of restoring the earth or otherwise, arising from such excavations and the laying of the pavements and repairs thereto, caused by the opening of any such street, alley or public place, shall be paid by said person or corporation, and said work shall be done under the supervision of the Board of Public Works, and the expense of such supervision shall be paid by said company, on presentation of bills, certified by said board, and any expense to which the city shall be put from neglect of said company or its employees in the doing of any work, or the doing of the same in an unworkmanlike manner, of the digging of ditches or holes and erection of poles, or restoring the earth or any excavation, or relaying or replacing of any pavement, shall be paid in like manner by said company on presentation of the bills of cost certified by said board, and it shall be the duty of said person or corporation in each instance to promptly pay all bills for labor and material, supervision, etc., incurred by the Board of Public Works in relaying and restoring any pavement or surface disturbed by said person, persons or corporation, and if said bills, properly certified by

the Board of Public Works, remain unpaid for the space of thirty (30) days after the presentation to said person or corporation, it shall be the duty of the Board of Public Works to pay over to the credit of the proper fund the amount of any bills so remaining unpaid from the guaranty money deposited by said person or corporation with said board, and on refusal, neglect or failure by said person, persons or corporation to make such guaranty money good to its full extent as herein first named prior to the next meeting of the Common Council, the Board of Public Works shall report the facts in the case to the Common Council for such action by the latter body as is permitted or deemed proper under the terms of the ordinance.

Sec. 6. The Public Lighting Commission shall have the supervision of the construction of all electric light lines of wires erected in pursuance of the authority hereby granted, and all connections made in any public building or buildings, as provided by chapter 13 of the charter of the City of Detroit. In the lines of wires or the laying of any conduits as herein provided, said Lighting Commission shall prescribe or determine the street or streets in which it shall be lawful to erect or construct lines of wires above ground, and no person shall erect any pole or train any wire for such lines above ground in any street or highway excepting the same be authorized by such permit.

Any person violating the provisions of this section shall be punished by a fine not exceeding five hundred dollars, and in the imposition of such fine the court may make a further sentence that the offender be imprisoned in the Detroit House of Correction until such fine be paid, provided the term of imprisonment shall not exceed the period of six months.

Sec. 7. Any permit hereby authorized shall not become operative and authorize the construction of any line of wires above ground or the laying of any conduits until the person or company to whom the same may be granted shall have filed with the City Controller a satisfactory bond, to be approved by the Controller, in the sum of twenty thousand dollars, conditioned that the person or corporation to whom such permit is granted will faithfully comply with and perform the terms and conditions of this ordinance; and such person or corporation shall also have deposited and shall keep on deposit with the City Treasurer the sum of two hundred dollars to cover the expense of the replacing of the earth in making the repairs to pavements required to be relaid by such person or company under the provision of this ordinance, and as a guarantee for the prompt payment of any bills for such work presented by the Board of Public Works, such deposit shall be kept good to the amount of two hundred dollars, and on failure to keep the same good to that amount such permit shall become void.

Sec. 8. In addition to all usual and ordinary taxes and general or special assessments for which any such person, persons or corporation shall be liable, he or it shall annually on the first day of July pay to the City of Detroit, as part of the consideration for the rights herein conferred, the annual sum of one dollar for each pole erected and maintained by it, and also the sum of \$5 per annum for each and every mile of wire operated and maintained by it, computation thereof to be based upon each strand of wire, whether above or below the surface of the ground, said sum to be paid to the City of Detroit for the first year or portion of a year within one month after the construction and erection of such poles, and annually thereafter on the first day of July in each and every year in advance. And the bond mentioned above in section 7 shall be further conditioned for the payment of said sums.

Sec. 9. Whenever the Public Lighting Commission shall deem it for the public interest they may require, as a condition to the issuing of any permit, that the wires shall be laid in the public conduits, and if any wires shall be strung on poles along any highway, and public conduits shall afterwards be laid therein, said commission may require the wires so strung upon poles to be taken down and put in the public conduit; and upon any refusal to do so, may remove the same. Said commission may prescribe the terms and conditions upon which the public conduits shall be used for such purpose.

Sec. 10. Any rights acquired under any such permit shall cease whenever the Common Council shall so direct, and all poles and wires shall thereupon be removed at the expense of the person or corporation erecting or controlling the same.

Sec. 11. When any wires erected under any such permit shall interfere with any wires of the Public Lighting Commission, or with any telephone or telegraph wires of the Fire Commission or of the Police Department, the Public Lighting Commission may direct the removal of the same, or such alterations in relation thereto as will obviate or prevent such interference. When any person or corporation shall have erected a pole on any portion of a street, it shall be subject to the condition that the Public Lighting Commission may authorize other persons to whom such permits may be granted, to use such pole already erected, and upon such terms and conditions as the Public Lighting Commission may direct.

Sec. 12. This ordinance shall take immediate effect.

Approved October 17, 1893.

Lighting System Ordinance.

AN ORDINANCE to protect the Public Lighting System.

It is hereby ordained by the people of the City of Detroit:

Section 1. That no person shall cut, break, injure, deface or destroy any building, engine, boiler, dynamo or other machinery or appliances, poles, lamp posts, towers, wires or conduits erected or constructed for the public lighting system of the city of Detroit.

Sec. 2. No person shall open or tamper with any manholes or handholes or any vault or junction box connected with the conduits of the public lighting system, nor shall any person, association, corporation, or company attempt to place or place any wires in said conduits, or upon the poles of said system without permission in writing from the Public Lighting Commission.

Sec. 3. No person, association, corporation or company shall post, paint, impress or in any way affix to any pole connected with the public lighting system of said city, or any box, lamp post, tower, wire or other appliance connected therewith, any placard, sign, notice or announcement of any kind, or cause or allow any kite or other obstruction to become entangled with the wires, or apparatus of said system.

Sec. 4. Any violation of any provision of this ordinance shall be punished by a fine not exceeding one hundred dollars and costs; and in the imposition of any fine the court may make a further sentence that the offender may be imprisoned in the Detroit House of Correction until the payment thereof, for any period not exceeding six months.

Sec. 5. This ordinance shall take immediate effect.

Approved September 17th, 1895.

Public Building Ordinance.

AN ORDINANCE relating to the lighting of public buildings.

It is hereby ordained by the people of the City of Detroit:

Section 1. That the city hall, municipal court building, all police stations, fire engine houses, house of correction, all public school buildings and all other buildings occupied by any of the several boards or commissions forming part of the government of the City of Detroit be and the same are hereby declared to be public buildings.

Sec. 2. It shall be the duty of the Public Lighting Commission to furnish the electrical current required for the proper lighting of all public buildings. Any electric current supplied by the said commission may be used in said buildings for the driving of ventilating fans or other similar appliances.



Sec. 3. During the remainder of the present fiscal year the expense of furnishing such electrical current shall be paid as heretofore by the common council or by the several boards and commissions using the same, but the Public Lighting Commission shall include in their estimates hereafter the expense of such lighting of all public buildings or such of them as the board or commission in charge thereof shall require to be lighted.

Sec. 4. Whenever any new public building shall be constructed it shall be the duty of the board or commission in charge thereof to submit the plans therefor to the Public Lighting Commission, and the said commission shall give such instructions as it may deem proper and necessary to insure the proper and safe wiring of such buildings and to supervise the same.

Approved December 12th, 1895.

An Ordinance to Regulate Electric Wiring and the Use of Electricity.

It is hereby ordained by the people of the City of Detroit:

Section 1. The Public Lighting Commission of the City of Detroit shall assume the supervision of the putting in of all electric wiring, connections and apparatus in or on any building in the City of Detroit, and shall establish rules and regulations to which all electrical equipments hereafter erected or used within the City of Detroit shall conform.

Sec. 2. The Public Lighting Commission may, with the consent of the Common Council, employ a sufficient number of competent electricians, not exceeding three, as inspectors, whose duty it shall be to examine each electrical equipment hereafter erected and make a detailed report of same to said commission as to whether it is in compliance with the rules and regulations of the commission, and a record of all such reports made by said inspectors shall be kept on file in the office of said commission, and when an equipment is found to conform to the rules and regulations adopted, the said commission shall issue a certificate in duplicate that the terms of this ordinance have been complied with, but no such certificate shall be granted until the equipment is made to conform to the rules prescribed herein, and it shall be unlawful to use any such electrical equipment or to furnish electrical current or currents for the same until certificate has been furnished in accordance with the terms of this ordinance, and the rules and regulations of said commission.

Sec. 3. No person, firm or corporation shall equip any building with wiring or apparatus, or make any alteration of, change in or addition to any electrical wiring or apparatus, without first notifying the Public Lighting Commission in writing and giving a general description of the work to be done, so that ample opportunity for inspection may be had, and receiving a written permit to do the work described, and such equipment, alteration, change or addition shall be done to the satisfaction of the Public Lighting Commission, who shall issue a certificate in like manner as provided in Section 2 herein.

Sec. 4. The Public Lighting Commission shall have the right and power, and it shall be their duty, to cause all electrical wires and apparatus now in or on any building in the City of Detroit to be inspected in order to ascertain whether the electric wiring or apparatus is in any respect dangerous to life or property, and if any part of said electrical wires or apparatus shall be found dangerous to life or property, the Public Lighting Commission shall notify the owner of the building or equipment to cease using the electric current in such dangerous equipment, and to have the defects in the said equipment repaired within a reasonable time, not exceeding ten days from date of notice. The Public Lighting Commission is also authorized to give written notice to the company furnishing the electric current to any such dangerous equipment to cease to supply same until the defects are repaired.

In a prosecution for the violation of the provisions of this section each day's neglect to comply therewith shall be taken as a separate violation.

Sec. 5. When upon application inspection is made of the wiring or equipment in any building in this city, the company or person installing such equipment shall, before

certificate is issued, pay to the Public Lighting Commission of this city for such inspection the following fees, viz.:

When wiring is for incandescent lights:

For 5 lights or less.....	\$ 25
When more than 5 lights, and not more than 15 lights.....	50
When more than 15 lights, and not more than 25 lights.....	75
When more than 25 lights, and not more than 50 lights.....	1 25
When more than 50 lights, and not more than 100 lights.....	2 00
When more than 100 lights, and not more than 150 lights.....	2 50
When more than 150 lights, and not more than 250 lights.....	4 00
When more than 250 lights, and not more than 500 lights.....	5 00

Arc lights, 50 cents each.

When wiring is for motors:

For motors of 1 horse or less.....	\$ 50
When motors are more than 1, and not more than 3 H. P.	1 00
When motors are more than 3, and not more than 8 H. P.	2 00
When motors are more than 8, and not more than 15 H. P.	2 00
When motors are more than 15.....	2 50

For inspection of electrical apparatus, for which no fee is herein prescribed, the Public Lighting Commission may charge a fee not exceeding 75 cents per hour for the time actually consumed by each inspector in making the inspection, and it shall be the duty of the Public Lighting Commission to turn all moneys received under this ordinance into the Public Lighting Fund of the City of Detroit.

Sec. 6. Any person, firm or corporation who shall do or attempt to do electrical construction work, whether original work or alterations, without giving notice in writing to the Public Lighting Commission, and obtaining a permit to do such work, shall, upon conviction thereof, be fined in the sum of not less than \$20 nor more than \$100 for each offense; and any person, firm or corporation who shall violate any of the provisions of this ordinance, for which a penalty is not herein otherwise provided, and any occupant or owner of premises where electric wiring or apparatus is used or to be used, who shall refuse to allow, or shall prevent or interfere with any inspector in the discharge of his duties under this ordinance, he or they shall, upon conviction for each offense, forfeit and pay a fine of not less than \$5 nor more than \$100, in the discretion of the court; and in the imposition of any fine or costs, the court may impose a further sentence that the offender be imprisoned in the Detroit House of Correction until the payment thereof, providing that the term of such imprisonment shall not exceed three months.

Sec. 7. This ordinance shall not be construed to relieve from or lessen the responsibility of any party owning, operating, controlling or installing any electrical equipment for damages to any one injured by any defect therein, nor shall the city be held as assuming any such liability by reason of the inspection authorized herein or certificates issued.

Sec. 8. This ordinance shall take effect upon and after August 1st, 1896.

Approved July 28th, 1896.

An Ordinance to Regulate Electric Wiring and the Use of Electricity.

It is hereby ordained by the people of the City of Detroit:

Section 1. That the Public Lighting Commission of the City of Detroit shall annually examine wiremen seeking to engage in that vocation (the term wiremen intending to and does hereby designate and refer to those who string, train or place electric wire on the inside of buildings, and not to apply to linemen, or those engaged in stringing, training or placing wire on the outside of buildings or structures), as to their ability to do such electrical work, upon written application for, and who apply in person for examination, and to such as pass said examination to the satisfac-

tion of the Public Lighting Commission, a permit in accordance therewith shall be issued by the said Lighting Commission; said permit shall be issued in the form of a badge, which said badge shall be worn in a conspicuous place on the person of such wireman or electrical worker while he is engaged in doing any manner of electric wiring or while engaged in making repairs to electrical wire or fixtures in any building or structure in said City of Detroit. And it shall be unlawful for any person to engage in doing any manner of electrical wiring or repairs to electric wire or fixtures, in any building without such badge conspicuously displayed on his person while engaged in such work. Any wireman or electrical worker (not including linemen) who fails to conform in every respect to the rules prescribed by this ordinance, or who loans or transfers his badge to another, does thereby revoke his permit, and it shall be the duty of the inspector of the Public Lighting Commission to take up and suspend said person to whom said badge has been issued and report same to the Public Lighting Commission, who shall give said person a hearing, and it shall be optional with the said commission to renew or revoke the said permit until the provisions of this ordinance are complied with.

Sec. 2. It shall be unlawful for any individual, firm or corporation to string or place any bare grounded wire, such as telegraph or telephone wires, on the same pole, stanchion or upright, with high potential wires, without separating said wires carrying high potential currents from said bare grounded wires by a distance of at least eight feet in the clear. And it shall be the duty of any individual, firm or corporation, quasi municipal or otherwise, to remove said bare wires to conform to this ordinance as herein provided, within ninety days from date of service of notice to separate said wires given by the Public Lighting Commission or its duly appointed agent. High potential wires in this ordinance being wires carrying currents of three hundred volts or over.

Sec. 3. It shall be unlawful for any individual, firm or corporation to encase, cover or introduce any wire, carrying electrical current into any iron pipe or any metallic electrical conducting material; affixed to any wooden pole, stanchion or upright, which shall extend nearer than eight feet from the lowest cross-arm on said wooden pole, stanchion or upright; and it shall be unlawful to expose any electrical wire without such insulation in any manner, which shall form a connection or circuit with the earth in such manner as to be dangerous or injurious to life or health. This provision not to apply or prevent the encasement of said wires in any non-conducting substance or material such as wood, etc.

Sec. 4. It shall be the duty of any company stringing bare wires wherever said wires cross trolley wires, to provide safe and suitable insulation for all such bare wires at such crossings where in case of breakage said wires would come in contact with the aforesaid trolley wires.

Sec. 5. It shall be the duty of the Public Lighting Commission, upon complaint of any citizen, to examine or cause to be examined any dangerously exposed electrical wires, and to notify the individual, firm or corporation owning or controlling the said exposed wire of its dangerous condition, and to have the same remedied at once, and made safe, and upon the failure of such individual, firm or corporation to remedy and make safe said dangerously exposed wire, it shall be the duty of the said Public Lighting Commission to cause a complaint to be made for a breach of this ordinance and to prosecute the said individual, firm or corporation for such breach; and any refusal or neglect to remedy said dangerously exposed wire, after due and proper notice from the said Lighting Commission, shall subject the individual, firm or corporation owning or controlling the same to a fine or imprisonment.

Sec. 6. All day circuits, excepting street railway circuits, of high potential currents shall be designated by some mark or distinctive insulator upon each wire at each insulator designate the same as such.

Sec. 7. It shall be the duty of any individual, firm or corporation to remove from any building, structure or pole all dead wires, which are not actually in use, within thirty days from notice given by the Public Lighting Commission.

Any breach of this ordinance shall subject the offender to a fine of not exceeding two hundred dollars, or to imprisonment for a period of not exceeding sixty days, and each subsequent breach of this ordinance shall be deemed a separate offense, and shall be so punishable.

Sec. 8. This ordinance shall take immediate effect.

Approved November 1st, 1898.

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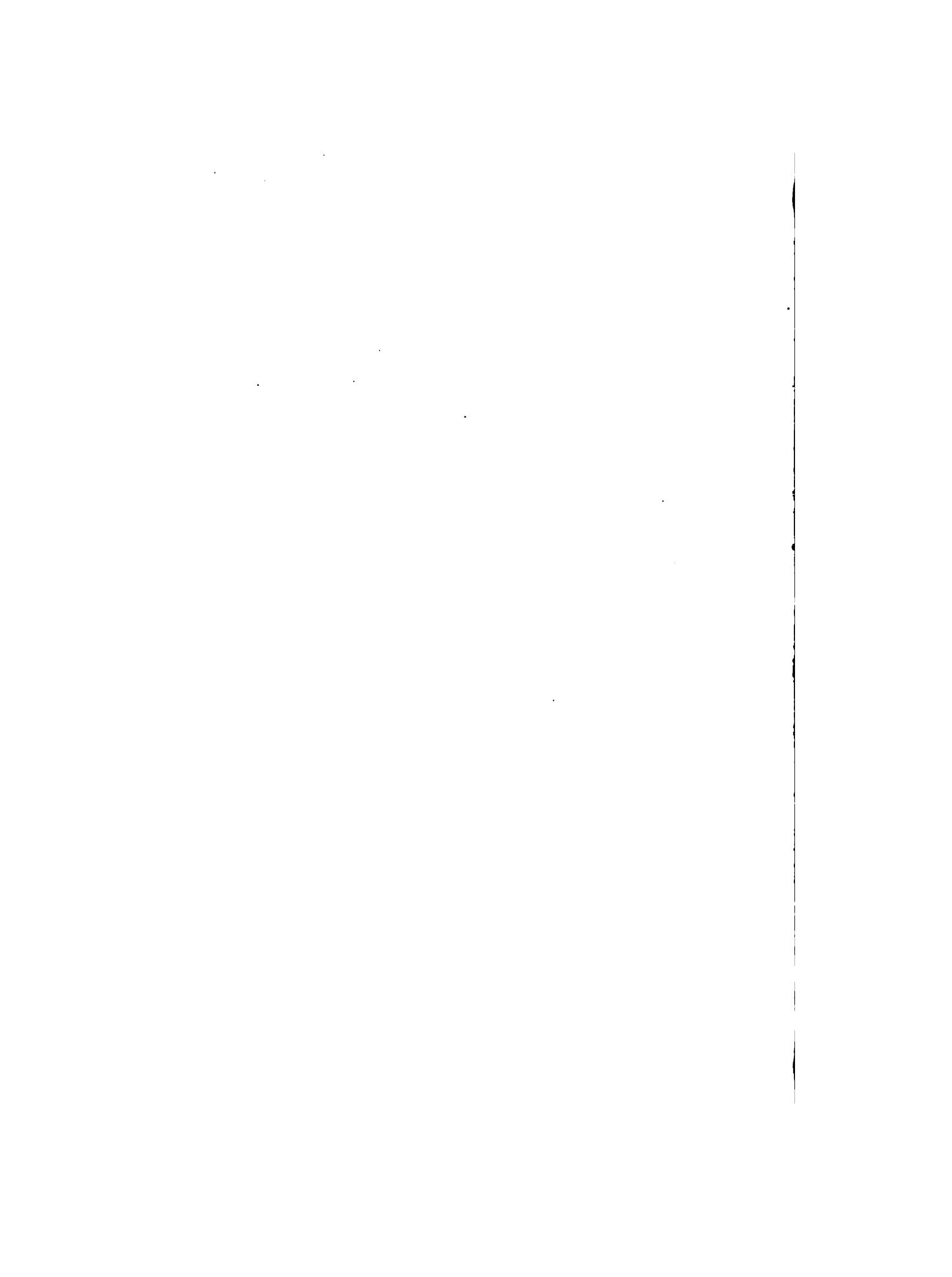
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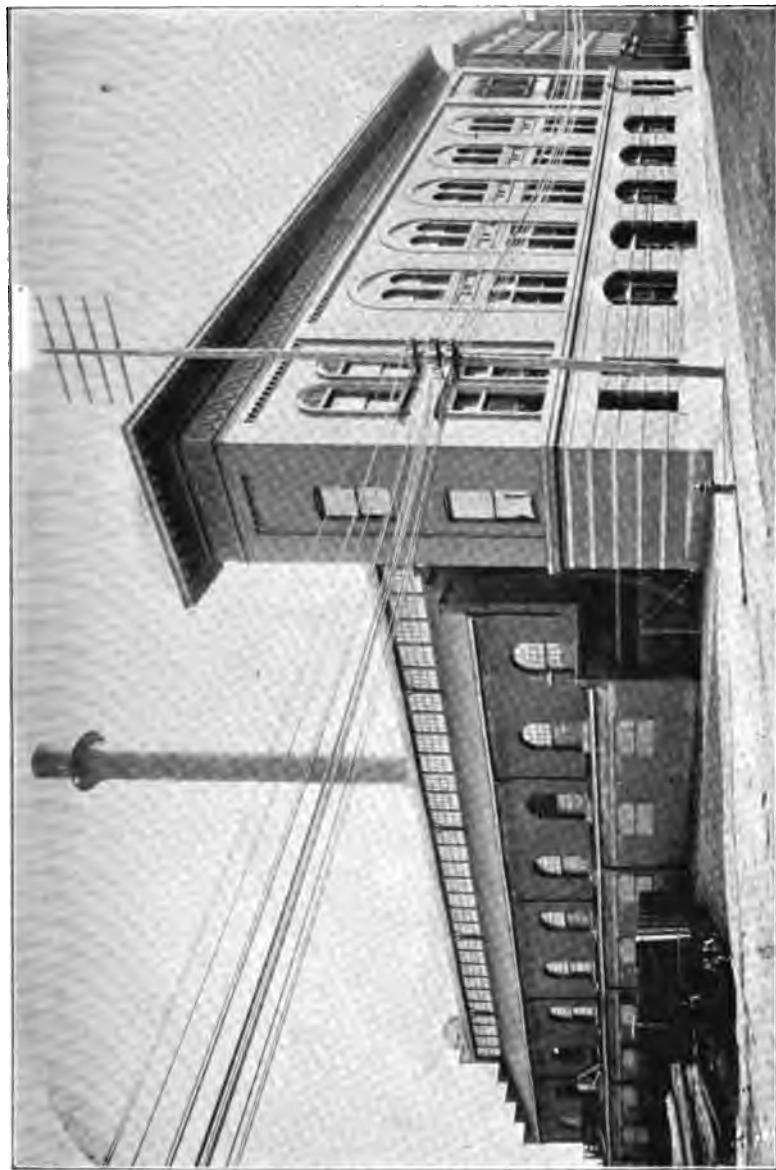
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ANNUAL
REPORT
OF THE
**PUBLIC
LIGHTING
COMMISSION**

1888





OFFICE AND STATION BUILDINGS.



PUBLIC LIGHTING COMMISSIONERS,
1901.

SIXTH
ANNUAL REPORT

OF THE

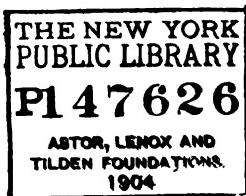
 Public Lighting Commission

CITY OF DETROIT.

Fiscal Year Ending June 30, 1901.

THE COMMISSION.

DAVID W. SIMONS, President.....	Term expires April 4, 1905
E. H. McCURDY, Vice-President.....	Term expires April 4, 1902
JAMES E. DAVIS.....	Term expires April 4, 1903
FREDERICK F. INGRAM.....	Term expires April 4, 1904
JOHN ERHARD.....	Term expires April 4, 1906
HAMILTON CARIHARTT.....	Term expires April 4, 1907
FRANK T. BOWLER.....	Secretary,
WILLIAM M. DALY.....	City Electrician and Gen'l Supt.
AUSTIN S. HATCH.....	Assistant Gen'l Supt.
Custodian of Funds.....	WM. B. THOMPSON, City Treasurer.
Auditor of Accounts.....	F. A. BLADES, City Controller.
City Accountant.....	FRANCIS J. DUCAT.



The Ex-Members of the Commission are:

C. A. NEWCOMB, April, 1893, to July, 1893.
MARTIN BUTZEL, April, 1893, to March, 1895.
GEORGE H. LOTHROP, April, 1893, to April, 1896.
W. A. JACKSON, April, 1893, to July, 1896.
EDWIN HENDERSON, April, 1896, to December, 1896.
W. R. FARRAND, April, 1893, to April, 1897.
J. L. HUDSON, April, 1893, to May, 1898.
JOHN ATKINSON, July, 1896, to July, 1898.
R. H. FYFE, July, 1893, to October, 1899.
C. H. RITTER, March, 1895, to January, 1900.
JOHN MINER, December, 1896, to January, 1900.
W. A. LIVINGSTONE, April, 1897, to January, 1900.



DETROIT, MICH., July 31, 1901.

TO THE HONORABLE THE COMMON COUNCIL,
City of Detroit, Michigan.

GENTLEMEN—The Public Lighting Commission respectfully submits for your consideration the accompanying report of the business intrusted to its care during the fiscal year ending June 30, 1901.

In the report an effort has been made to present such data as will best convey an understanding of the work done, the costs of municipal lighting and the condition of the city's investment.

We have the honor to be,

PUBLIC LIGHTING COMMISSION,
By DAVID W. SIMONS, President.
FRANK T. BOWLER, Secretary.

Office of the Public Lighting Commission.

Detroit, Mich., Oct. 1, 1901.

To the Hon. Public Lighting Commissioners:

Gentlemen:—

I submit the sixth annual report of the business and operation of the Public Lighting Plant, covering the fiscal year ending June 30, 1901, fully confident that additional demonstration has been made of the success of public lighting in Detroit. While it is true that there has been a slight increase in the cost of operation for the year, namely, 86 cents per arc light, gross cost, and \$2.29 per arc light cash cost, yet a careful comparison of this year's conditions with those that obtained in previous years will show that the efficiency and economy of administration have been substantially increased. It must be remembered that during the year just closed the cost of labor and of all classes of supplies have shown a marked increase. It is a striking fact that the increase in the cost of coal alone was \$1.69 per arc light, which item will, in itself, more than account for the increase in the gross cost per arc light. It must also be borne in mind that as the age of the plant increases the necessary cost of repairs and of replacing of parts, which is added to the cost of operation, must also increase. During a year therefore of unfavorable conditions for the manufacture of any commodity cheaply we must feel gratified that the Public Lighting Plant has been operated with but a nominal increase in cost.

The entire maintenance and operating cost for the last fiscal year was \$99,094.62 as compared with \$90,087.73 for the preceding year, showing an increase of \$9,006.89. The output of the plant, however, was 3,973,350 Kilowatt Hours as against 3,789,050 Kilowatt Hours last year, showing an increase in the output of 184,300 Kilowatt Hours.

The following table will show the ratio of increased expenditures among the different departments:

	Wages.		Stores.	
	Increase.	Decrease.	Increase.	Decrease.
Maintenance	\$1,214.02	\$	\$2,468.60	\$
Executive .....	....	481.46	132.53	....
Station	453.28	....	4,396.82	....
Lighting	1,732.21	....	....	651.24
Shop supplies .....	....	....	....	27.79
Injuries and damages.....	....	99.38	....	651.24
 Totals	 \$3,399.51	 \$ 580.84	 \$6,997.95	 \$ 809.73
Total increase	\$10,397.46			
Total decrease	1,399.57			
 Net increase	 \$ 9,006.89			

While always keeping in mind that economy of operation is one of the main ends to be attained, yet the Commission has never been forgetful of other ends to be subserved by the Public Lighting Plant. No striving, therefore, after a reduction of operating expenses in the different departments has been permitted to impair the efficiency of the lighting service given to the city. The Commission has always been mindful also of the beauty of our city and it has always been its aim to interfere as little as possible with the sightliness of her streets, even when the closest economy might have countenanced a somewhat different policy, and it is unfortunate that in this regard the Commission has not met with the unqualified assistance and encouragement of other public boards.

The total output of the plant for the year was as follows:

For arc lighting.....	3,475,389	Kilowatt Hours.
For incandescent lighting.....	497,961	" "
Making a total of.....	3,973,350	" "
Total for preceding year.	3,789,050	" "
Average number of 2,000 candle power arc lights.....	2,035	
Same for preceding year.....	1,963	

The Commission upon careful consideration have found no reason to change the method of arriving at the actual cost of an arc light per year to the city.

To the cash cost of operating the plant is added the fixed charges, as follows:

Depreciation on the entire investment of \$744,187.17, at 3%, June 30th, 1901.....	\$ 22,325.61
Interest on the net investment, July 1st, 1900, \$720,620.34, for one year at 4%.....	28,824.81
Lost taxes (the amount the city would get as taxes were the plant owned by a private corporation) are figured by charg- ing to the operation of the plant at the regular rate of tax-a- tion for the city, county, and state. The probable assessed value, based upon a comparison with the assessed values of other plants of like character, similarly located in the city, is placed at \$351,885.00. This amount at \$18.07 per \$1,000 is.....	6,358.56
Cash cost of operation is.....	99,094.62
Making a total cost of.....	\$156,603.60

Total cost proportioned between arc and incandescent plants accord-ing to output of each is as follows:

Arc plant	\$136,977.22
Incandescent plant	19,626.38
Total	\$156,603.60

Cost of operation per arc light (cost of operation divided by average number of lights, 2,035).....	\$67.31
Cost per arc light subdivided—	
Operating disbursements	\$42.59
Interest at 4% on investment.....	12.39
Depreciation at 3% on investment.....	9.60
Lost taxes on investment.....	2.73
Total	\$67.31
Gross cost per arc light, fiscal year ending June, 1900.....	66.45
Increase .....	.86
Cash cost per arc light, fiscal year ending June 30, 1901.....	\$42.59
Cash cost per arc light, fiscal year ending June 30, 1900.....	40.30
Increase	\$ 2.29

As has been shown in reports of previous years, the gross cost of operation to the Commission is by no means the measure of the cost of public lighting to the citizens of Detroit. Certain incomes accruing to the Commission go to reduce the actual cash cost of operation to the taxpayers, while a saving of expenditure formerly made by other agencies of the city government and now saved by virtue of the existence of this Commission make a further reduction in cash cost.

These items may be summarized as follows:

Proportion of time of City Electrician and Assistant now saved by Commission, per annum.....	\$1,200.00
Collections from rentals.....	4,110.99
Total	\$5,310.99

Averaging this deduction from the cash cost reduces the cash cost per arc light from \$42.59 to \$40.31.

The income from the rental of conduits would be greatly increased and the cash cost of lighting correspondingly decreased were it possible to compel private companies to place their wires underground and to use the conduits of the Commission. In view of such use by private companies, the Commission has provided many more ducts than are at present used. The interest, depreciation, and lost taxes upon the surplus conduit investment deducted from the fixed charges would further reduce the gross cost of operation.

The Commission during the last fiscal year was confronted with the necessity of providing for an increased output. July 1, 1900, found the Commission with a demand for 600 new lamp locations, an overload of 10% on 19 arc machines in order to hold one set of four in reserve, and an incandescent service with a 10% overload and no reserve. The floor

space of the station was already filled, so to meet this demand the problem resolved itself into installing a system of direct connected units or enlarging the station. The former involved a complete change of station equipment, the latter meant the installing of the same or a different method of equipment for the extensions. After carefully weighing the cost of construction and operation, and inspecting the methods being adopted by the best plants, both private and municipal, it was decided to install the series, enclosed, alternating arc system.

There were installed during the year:

One Triple-Expansion Marine Type Engine, cylinders 17 in. by 27 in. diameter and 30-in. stroke, 120 revolutions per minute, 160 pounds steam pressure, 1,000 Horse Power Maximum, at 26 in. vacuum, and direct connected to a 600 Kilowatt 2 phase Stanley Alternator, at 2,200 volts each phase.

One 175 Kilowatt Stanley 2 phase Alternator, 2,200 volts, at 500 revolutions per minute.

One 40 Kilowatt Northern Electric 125 volt direct current Dynamo, at 325 revolutions per minute, to be direct connected to Westinghouse engine and used as an exciter.

Realizing that the Commission was established to do all the city lighting, the necessity of furnishing light and power to the new County Buildings and to school, fire and police buildings was also taken into consideration, so the method of sub-station distribution was adopted and an appropriation was made by the Board of Estimates to enable the first station to be built. This sub-station will be equipped during the coming year and will supply 300 arc, 1,000 incandescent and 13 horse power in motors. Another item taken into consideration was the item of maintenance. While the repairs were kept up year by year, there was a constant deterioration which could not be replaced each year such as rusting of iron, rotting of poles, rebuilding of lines caused by the growth of trees, and the painting of buildings; this being designated as maintenance. Much of this work was done during the past year preparatory to the new installation. There was spent for this purpose a total of over \$8,000.00. From all this it will be readily understood why the plant did not show its usual decrease in the cost of operation.

Public lighting may be deemed no longer an experiment in the City of Detroit. Its success has been demonstrated. But while the experience of the last six years leads to the conclusion that municipal lighting can be done efficiently and at a saving to the taxpayers, it has also demonstrated that such results can be obtained only by the most rigid and careful economy, the application of the highest order of business method, and a complete alienation of those influences which often hamper and harass the operations of public boards. It must be remembered that the work of this Commission in one important respect differs from that of other public boards. This Commission is not alone performing certain public functions

as are other departments of the city government, but it is manufacturing a commodity which has a definite and measurable market value and quality, and which can be readily compared with that produced by private companies. It therefore behooves this Commission to be continually alert lest its efficiency and independence of conduct be hindered by circumstances to which private manufacturers are not a prey. That the Commission has for the most part been free from such influences its success is indicative, but a word of warning is always opportune and may keep us from lulling ourselves into too great a feeling of security. So long as we apply the same business principles as have been in the main applied in the past, so long will municipal lighting be successful and demonstrate the wisdom of the taxpayers who established it.

Yours respectfully,

DAVID W. SIMONS,

President.



SIX LIGHT TOWER ON CAMPUS MARTIUS.



MAST ARM.

The City's Lighting Plant.

The property owned and controlled by the Public Lighting Commission now consists of the following:

The power house and office building located on Atwater street, between Bates and Randolph, having a frontage on Atwater street of 213 feet, 163 feet of which extends back an average of 318 feet 6 inches to the river front and 50 feet of which on the east extends back only a distance of an average of 68 feet. (The complete plan of the station will be found on page 26.)

The boiler house contains seven Double Deck Tubular Boilers, C. C. Peck design. Each boiler has 3,000 square feet of heating surface and is equipped with the Hawley Down Draft Furnace and Hoppes Live Steam Purifier and Worthington Water Meter. Five of these boilers are used at one time to operate the plant, the other two being kept in reserve. A change is made every six weeks, and each boiler as it is put out of commission is given a complete overhauling and cleaning. The coal is handled "Hunt" industrial railway. The coal bins adjoin the firing floor and have a capacity of 800 tons. A sidetrack built by the Commission in Atwater street, and connected with the railway tracks at Riopelle, allows cars of coal to be pushed in alongside and unloaded directly into the coal bins. The Commission has contracted for its own track scales and all coal on "our weights."



REAR OF POWER HOUSE.

The Pump Room contains: One Fire Pump of 1,000 gallons per minute capacity. This pump is connected to a complete system of fire mains and is always under steam. It is used during the day to feed the boilers and to operate a water motor which runs the machine shop.

One Worthington Pressure Pattern Feed Pump, in reserve, of 100 gallons per minute capacity. This is connected to a duplicate boiler feed system.

Two Worthington Jet Condensers, with feed pumps attached. Either condenser will condense 36,000 pounds of steam per hour, and the auxiliary feed pump can feed the same amount of water to the boiler. All of the water used in the operation of

the plant is pumped by the above machinery from the Detroit river.

One Wainwright Heater, which utilizes the exhaust steam from the pumps and small engines in heating the boiler feed water.

One Westinghouse Air Compressor, which supplies the compressed air for cleaning machinery.

The Engine Room contains the following:

ARC LIGHTING PLANT:

Five triple expansion, marine type engines; 200 revolutions per minute; 160 pounds steam pressure; 25-inch vacuum; cylinders, 11 $\frac{1}{4}$ -inch, 18 inches and 29 inches in diameter, and 18-inch stroke; horse power at maximum efficiency is 340.

Twenty 50-kilowatt, four-pole Western Electric Co. Arc Dynamos for constant current at 9.6 amperes; speed, 500 revolutions per minute. Four dynamos are driven by each engine, the connection being 7 $\frac{1}{2}$ -inch cotton ropes to each dynamo.

Three 57 $\frac{1}{2}$ -kilowatt, two-pole Western Electric Co. Arc Dynamos for constant current at 9.6 amperes; speed, 465 revolutions per minute. Each dynamo is direct connected to a 100 horsepower, triple expansion Willans center-valve engine.

One 7-kilowatt, two-pole Brush Arc Dynamo; 1,080 revolutions; 6 $\frac{1}{2}$ amperes; belt connected to same Westinghouse Compound En-



PUMP ROOM.



DOWNTOWN POST.

gine as operates one Westinghouse alternator. This machine furnishes current for a small circuit of enclosed arc lamps.

INCANDESCENT LIGHTING PLANT:

Three Compound Westinghouse engines, run non-condensing; cylinders, 9-inch and 15-inch, with 9-inch stroke; speed, 350 revolutions per minute.

Three 55-kilowatt two-phase Westinghouse Alternators, belt driven. Alternators are run in parallel; 1,100 volts primary, 110 volts secondary.

Two excitors, one belt-driven and one direct-connected to a Westinghouse Standard Engine.

One Triple-Expansion Marine Type Engine, cylinders 17x27x46 inches diameter and 30-inch stroke, 120 revolutions per minute, 160 pounds steam pressure, 1,000 horse-power maximum, at 26-inch vacuum, and direct connected



DOUBLE POST—UNDERGROUND DISTRICT.

to a 600-kilowatt two-phase Stanley Alternator, at 2,200 volts each phase.

One 175-kilowatt Stanley two-phase Alternator, 2,200 volts at 500 revolutions per minute.

One 40-kilowatt Northern Electric 125-volt direct current dynamo, at 325 revolutions per minute, to be direct connected to Westinghouse engine, and used as an exciter.

ARC LAMPS:

The 2,055 arc lamps in use are subdivided as follows:

- 1,812 "Brush" double carbon.
- 220 "Adams-Bagnall" single carbon.
- 5 "Adams-Bagnall" enclosed arc.
- 1 "General Electric" enclosed arc.
- 1 "Western Electric" enclosed arc.
- 10 "Western Electric" enclosed arc.
alt. current.
- 6 "General Electric" enclosed arc,
alt. current.



CENTER SUSPENSION.

POLES AND LINES:

The overhead lines of the plant are strung on a total of 7,110 poles, owned as per the following table. On these poles the Commission has strung a total of 424 miles of copper wire.

Number of poles used by Public Lighting Commission and owned as follows:

	Increase.	Annual Report 1901.	Annual Report 1900.	Decrease
Public Lighting Commission.....	112	5,864	5,752	..
Fire Commission	37	581	544	..
Police Commission .....	..	459	459	..
Edison Illuminating Co.....	..	66	77	11
Michigan Telephone Co.....	51	126	75	..
Street railways .....	..	14	35	21
	—	—	—	—
	200	7,110	6,942	32

Net increase, 200—32=168.

The poles of the Public Lighting Commission are used by other parties as follows:

	Increase.	Annual Report 1901.	Annual Report 1900.	Decrease
Fire Commission	491	1,382	891	..
Police Commission .....	..	873	873	..
Edison Illuminating Co.....	82	1,399	1,317	..
Michigan Telephone Co.....	920	1,894	974	..
East Side Electric Company.....	8	86	78	..
Detroit Still Alarm Co.....	..	169	242	73
Street railways .....	..	523	523	..
Detroit Shipbuilding Co.....	1	1	....	..
Parke, Davis & Co.....	..	1	1	..
Western Union Telegraph Co.....	1	1	....	..
Strubel Bros.....	..	....	9	9
	—	—	—	—
	1,503	6,329	4,908	82

Net increase, 1,503—82=1,421.

THE UNDERGROUND SERVICE—CONDUITS:

The conduits vary in size from 2 ducts to 24 ducts. The ducts are a special 3½-inch vitrified clay tile laid in concrete.

The total amount of conduits is as follows:

Size of Line.	Length of Line.	Lineal ft. of single ducts.
2 ducts	210 ft. 2 in.	420 ft. 4 in.
4 ducts.....	6,451 ft. 5 in.	25,805 ft. 8 in.
6 ducts	2,371 ft. 7 in.	14,229 ft. 6 in.
9 ducts.....	21,340 ft. 9 in.	192,066 ft. 9 in.
10 ducts	138 ft. 1 in.	1,380 ft. 10 in.
12 ducts.....	95 ft. 0 in.	1,140 ft. 0 in.
15 ducts	560 ft. 10 in.	8,412 ft. 6 in.
16 ducts.....	2,104 ft. 8 in.	33,674 ft. 8 in.
24 ducts	347 ft. 2 in.	8,332 ft. 0 in.
Tunnel, 6 ft. 2 in. x 3 ft. 6 in.....	231 ft. 0 in.	
Tunnel, 5 ft. x 3 ft.....	96 ft. 0 in.	
Manholes, 155.....	887 ft. 7 in.	
<hr/>		
Totals	34,834 ft. 3 in.	285,462 ft. 3 in.

LATERAL CONDUITS:

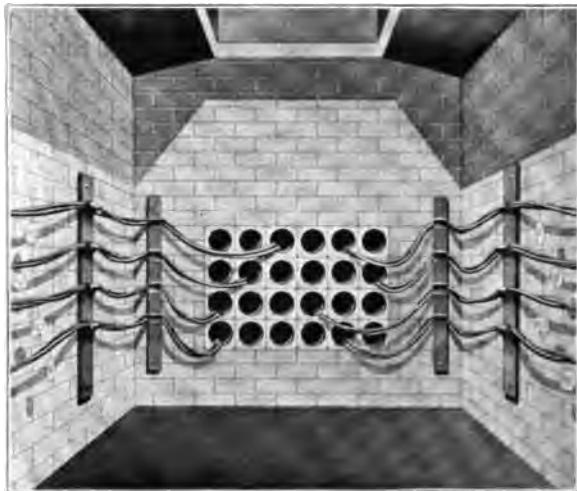
Consisting of 2½ in. lap welded iron pipe..... 44,549 ft.

349 Handholes, 3 feet in length..... 1,047 ft.

Total 45,596 ft.

Of the above conduits in the streets of the city, the Commission has rented the following:

Edison Illuminating Co..... 7,514 duct feet.



UNDERGROUND MANHOLE.

The rates charged for rental of conduits are as follows:

For single duct, 5c per foot per annum.

For two ducts paralleling each other, 9c for the two ducts per foot per annum.

For three ducts paralleling each other, 12c for the three ducts per foot per annum.

All such rentals are subject to the Rules and Regulations adopted by the Commission May 25th, 1897.



TUNNEL UNDER WOODWARD AVENUE,
AT CAMPUS MARTIUS.

In the conduits the following lead covered, rubber insulated cables are used as conductors:

Arc lighting circuits, No. 4, B. & S. gauge.....	216,336 ft.
Incandescent feeders, No. 4, B. & S. gauge.....	36,576 ft.
Incandescent mains, No. 8, B. & S. gauge.....	29,746 ft.
Incandescent feeder, No. 0, B. & S. gauge.....	3,000 ft.
<hr/>	
Total	285,658 ft.

All of the wires of the lighting system within the half-mile circle and a great portion of them inside the mile circle are under ground.

BELLE ISLE PARK:



POST - BELLE ISLE PARK.

Belle Isle, the principal city park, an island 700 acres in extent, located at the head of Detroit River and opposite the eastern end of the city, is lighted by the Commission entirely. All the wires are underground, 52,000 feet of $3\frac{1}{2}$ -inch wood conduit having been laid for this purpose, nearly one-half of which is still available for pulling in of cables. The bridge to the Island and the more important points on the main roadways are lighted by arc lamps, supported on ornamental iron posts. Fifty-one arc lamps are used and they are operated until 12 midnight as a part of the regular city circuits. Twenty-five thousand feet of No. 4 B. & S. gauge lead covered cable is used for this service.

The buildings in the west end of the park are lighted by incandescent lights, the current for which is obtained from mains connected with the central transformer station, where pairs of transformers receive three-phase alternating current at 3,500 volts and

deliver two-phase alternating current at 116 volts. The crossing of the Detroit River with the three-phase feeder and the connection of the transformer station is accomplished by the use of 14,500 feet to No. 6 B. & S. gauge three-conductor, lead covered and rubber insulated cable, a part of which is armored with iron wire and placed under the river. The secondary mains connecting the several buildings with the transformer house are made up of 5,800 feet of No. 00 two-conductor and 1,100 feet of No. 1 two-conductor rubber insulated and lead covered cable and 3,000 feet of No. 4 single conductor cable.

The lighting in Water Works Park is done by 14 arc lights. The entire system is underground and was installed by the Water Commission at its own expense, this Commission furnishing the cur-



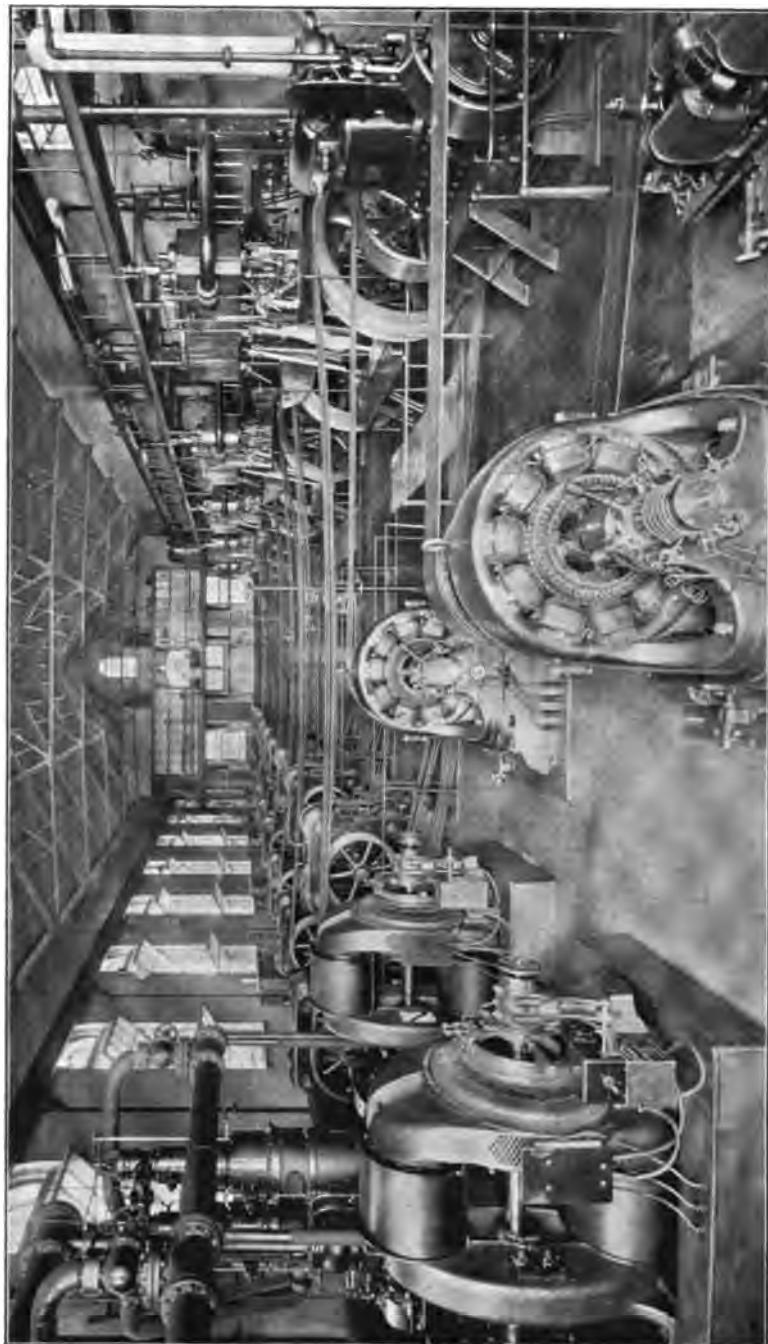
The tower system used by the city in connection with the street lighting is a unique feature. These lights may be seen many miles away by the traveler approaching. The 137 towers in use may be classified as follows:

2	165 feet in height.
1	160 feet in height.
124	150 feet in height.
2	125 feet in height.
8	100 feet in height.

Total.. 137



CRANE FIXTURE.



GENERATOR ROOM.

Cost of The City Lighting Plant.

The city's investment proportioned between the incandescent and arc lighting on the basis of the electrical output is as follows:

	Arc.	Incandescent.	Total.
*Conduits	\$ 83,557.44	\$ 8,825.99	\$ 92,383.43
Cables	49,609.84	5,760.31	55,370.15
Buildings and wharf.....	99,894.02	10,310.94	110,204.96
Real estate	57,222.81	5,902.19	63,125.00
Machine shop	7,263.88	750.28	8,014.16
Lines and poles.....	130,815.93	13,817.14	144,633.07
Towers and lamp posts.....	97,755.04	.....	97,755.04
Steam plant	102,051.55	10,579.37	112,630.92
Electric plant, arc.....	60,949.12	.....	60,949.12
Electric plant, incandescent.....	.....	13,631.84	13,631.84
Railway tracks and scales	9,955.43	1,026.88	10,982.31
Arc lamps	55,678.62	.....	55,678.62
 Totals	\$754,753.68	\$70,604.94	\$825,358.62
Belle Isle, lines, cables, lamps, etc.....	.....	26,296.21	.....
 Grand total .....	.....	.....	\$851,654.83

*About one-quarter of these are occupied.

Cost Reduced to a Lamp Basis.

Reducing the above investment, exclusive of the Belle Isle, to the amount per lamp on the basis of the electrical capacity of the plant, viz.: 2,375 arc of 2,000 candle power, and 3,500 incandescent of 16 candle power, and we have the following:

	Arc.	Incandescent.
Conduits occupied	\$ 8.80	\$.63
Cables	20.89	1.65
Real estate	24.09	1.69
Buildings and wharf.....	42.06	2.95
Lines and poles.....	55.08	3.95
Towers and lamp posts.....	41.16	....
Arc plant	25.66	....
Incandescent plant .....	.....	3.89
Steam plant	42.97	3.02
Railway track and scales.....	4.17	.29
Machine shop	3.10	.21
Arc lamps and switches.....	23.44	....
 Totals	\$291.42	\$18.28

Public Lighting System Investment.

To June 30, 1901.

The amount expended for investment accounts during the periods specified were as follows:

	Prior to June 30, 1899.	Year 1899.	Year 1900.	Total to June 30, '01.
Conduits	\$ 86,558.20	\$ 4,166.97	\$ 1,658.26	\$ 92,383.43
Cables	37,187.04	1,109.43	17,073.68	55,370.15
Real estate	63,125.00	.....	.....	63,125.00
Buildings and wharf....	110,004.50	.....	200.46	110,204.96
Lines and poles.....	136,063.48	5,271.79	3,297.80	144,633.07
Towers and lamp posts.	97,436.95	99.59	218.50	97,755.04
Arc plant	60,885.73	5.00	58.39	60,949.12
Incandescent plant	13,404.03	78.13	149.68	13,631.84
Steam plant	111,847.47	2.40	781.05	112,630.92
Railway track and scales.	10,982.31	.....	.....	10,982.31
Machine shop	8,014.16	.....	.....	8,014.16
Arc lamps and switches.	54,066.59	1,596.43	15.60	55,678.62
Belle Isle plant.....	24,228.01	1,954.79	113.41	26,296.21
 Totals	 \$813,803.47	 \$14,284.53	 \$23,566.83	 \$851,654.83

Depreciation Account.

DEBITS.

To investment prior to June 30, 1897.....	\$729,222.73
To investment during year to June 30, 1898.....	60,923.00
To investment during year to June 30, 1899.....	23,657.74
To investment during year to June 30, 1900.....	14,284.53
To investment during year to June 30, 1901.....	23,566.83

Total amount charged to investment..... \$851,654.83

CONTRA.

(See introductory remarks in annual report of years referred to.)

By amount added to cost of lights for depreciation prior to June 30, 1897	\$ 40,145.73
By amount added to cost of lights for depreciation year ending June 30, 1898.....	22,500.00
By amount added to cost of lights for depreciation year ending June 30, 1899.....	22,534.71
By amount added to cost of lights for depreciation year ending June 30, 1900.....	22,287.22
By amount added to cost of lights for depreciation year ending June 30, 1901.....	22,325.61

Total amount added to cost of lights for depreciation..... \$129,793.27
Balance present investment June 30, 1901..... \$721,861.56

Arrangement of Arc Lamps.

The lighting of the city is done exclusively by means of arc lamps of 2,000 candle-power. The lights are placed on towers, posts and center suspensions, as the conditions demand. The 2,042 arc lamps in operation on June 30th, 1901, were distributed in 1,714 locations, as follows:

955 cranes	955 lamps.
152 center suspensions	152 "
297 mast arms	297 "
161 posts from underground.....	161 "
4 posts from underground.....	8 "
*114 three-light towers	342 "
22 four-light towers	88 "
1 six-light tower	6 "
On tower at water works.....	4 "
On base of three towers.....	3 "
In six buildings.....	26 "
	————— 2,042
Stock, not in operation	11
Discarded	2 13
	—————
Total number of lamps.....	2,055

*Twenty-nine of these should be four-light towers.

There being no appropriation allowed for new lamp locations for the fiscal year 1900, one lamp was removed from each of these towers to furnish pole lights needed in new residence sections of the city.

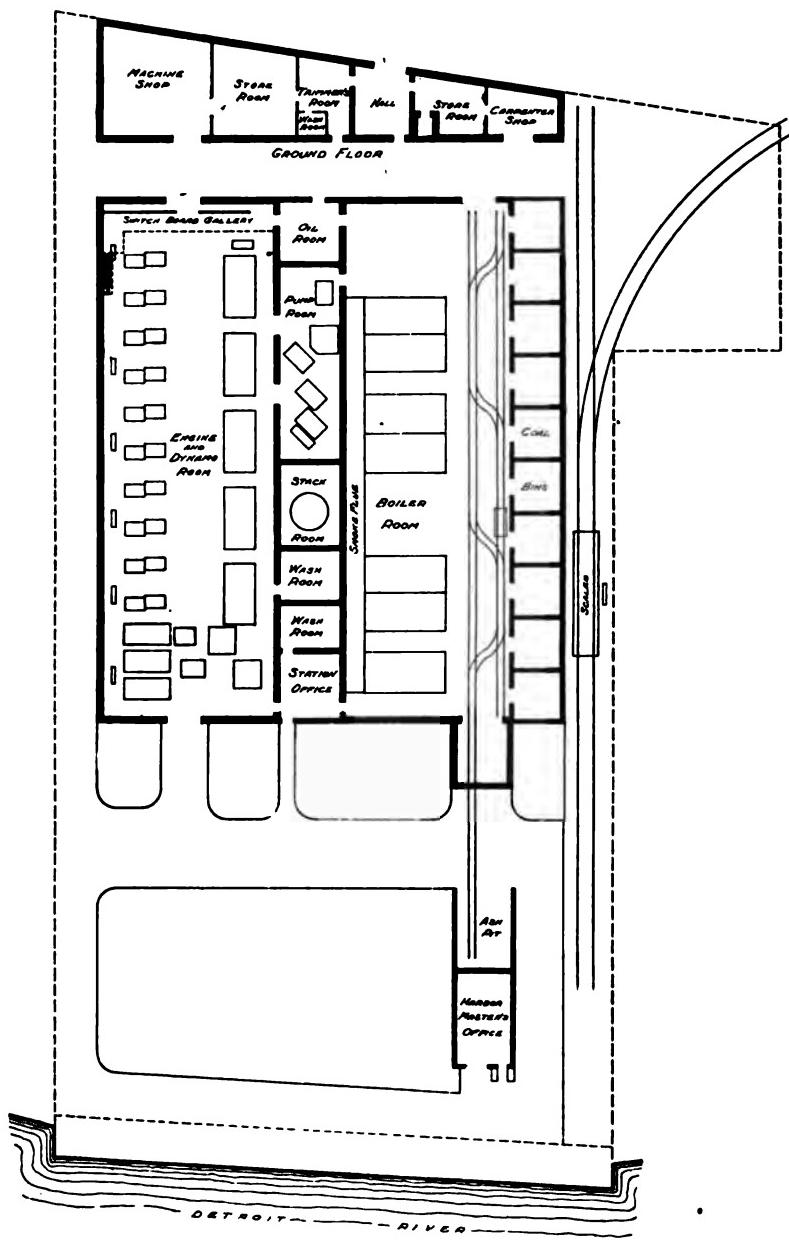
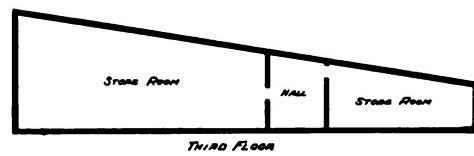
Ninety-eight tower lamps are on underground circuits.

Hours of Lighting.

Month.	Total Hrs. Operated.	Av'ge Hrs. Operated.
July	228:15	7:22
August	264:10	8:32
September	295:45	9:52
October	354:25	11:26
November	377:00	12:34
December	408:45	13:11
January	399:25	12:55
February	332:15	11:52
March	329:50	10:39
April	275:40	9:11
May	246:20	7:56
June	217:40	7:02
	—————	
	3,729:30	10:13

Distribution of Lamps by Wards.

Ward.	Population.	Acreage.	Assessed Value of Real Estate.	STREETS			Arc. Bernstein
				Total L. Ft.	Total Miles.	Paved L. Ft.	
	City...315,115	17,564.67	\$ 175,766,625	2,764,933	523.86	1,416,530	268.22
1	16,557	1,072.39	\$ 31,360,350	177,150	33.55	139,400	26.40
3	19,248	736.23	7471,810	126,678	23.99	77,200	14.60
5	21,325	636.36	6712,550	116,720	22.10	79,820	15.11
7	18,931	666.48	5,857,250	112,243	21.25	64,945	12.30
9	29,636	875.73	7,145,220	156,240	29.59	66,175	12.53
11	20,211	646.14	5,882,070	134,175	25.41	69,525	13.17
13	16,446	1,070.61	6,025,110	165,685	31.37	61,375	11.62
15	10,433	1,151.54	6,144,520	163,053	30.97	64,850	12.28
17	11,728	2,560.00	8,083,060	344,539	65.25	55,700	10.55
	Total...164,515	9,415.48	\$ 84,681,940	1,496,483	283.48	678,990	128.56
2	12,656	836.96	\$ 36,912,760	141,784	26.85	124,350	23.55
4	18,094	937.44	134,90,820	159,679	30.24	119,220	22.58
6	20,861	780.58	8,756,350	132,552	25.10	100,925	19.11
8	20,292	991.79	8,285,830	179,086	33.91	106,630	20.19
10	24,258	979.68	7,166,480	139,685	26.64	109,450	20.73
12	19,440	990.79	5,792,210	139,930	24.79	72,885	13.80
14	14,869	1,175.36	5,813,380	160,499	30.39	70,520	13.35
16	20,130	1,456.59	4,866,850	224,235	42.46	33,560	6.35
	Total...150,600	8,149.19	\$ 91,084,680	1,268,450	240.38	737,540	139.66
	Lamps in Wards as per above...						
	" on Belle Isle and Bridge						1956
	" in Water Works						62
	" in Buildings						14
							10
	Total Number of Lamps in Operation						2042
							13



GROUND PLAN OF PUBLIC LIGHTING STATION.

Public Buildings Lighted.

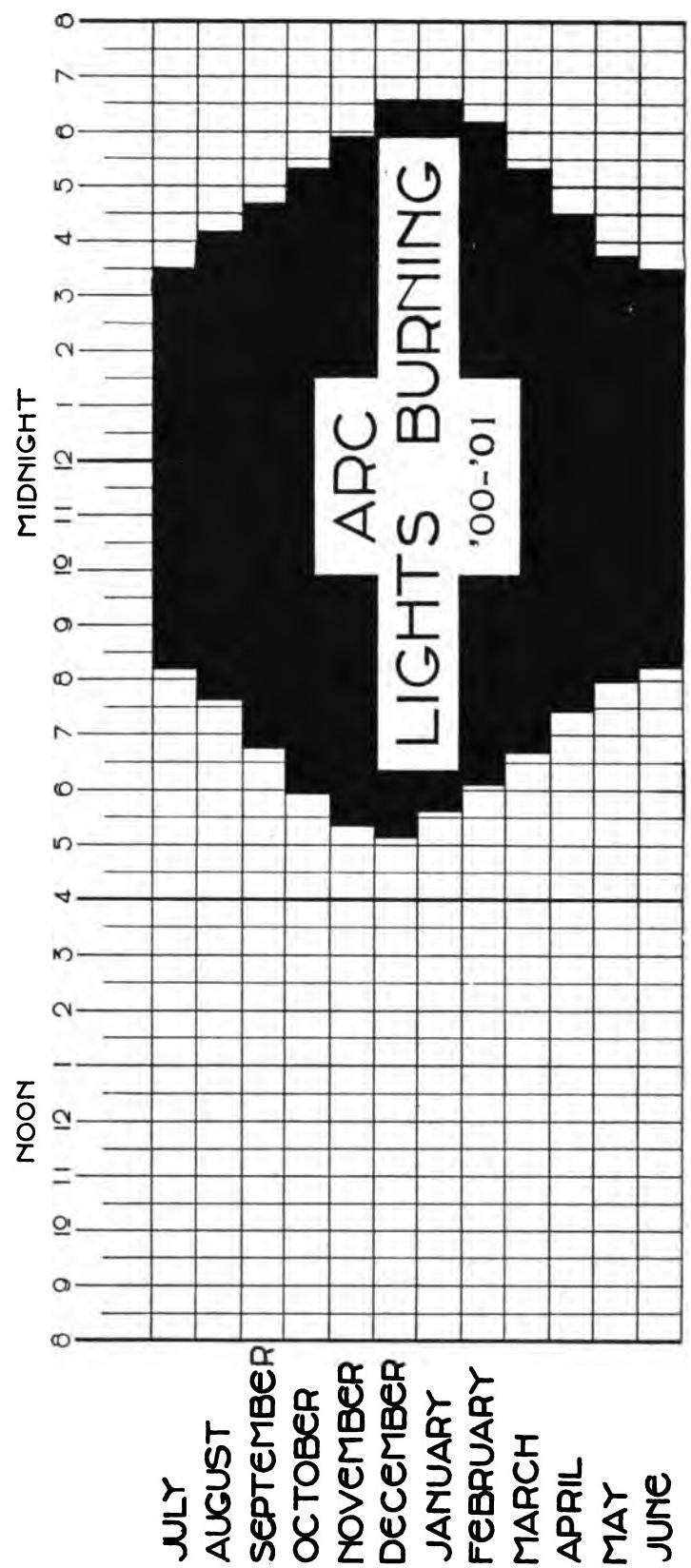
The public buildings lighted by incandescent lights and the number of 16 candle-power lamps in each, are as follows:

Public Lighting Station and Offices.....	400
City Hall and County Offices.....	*1,631
Public Library	948
Municipal Court Building.....	287
Board of Health Offices.....	53
Police Headquarters, Central Station.....	201
Police Headquarters, East Side.....	108
Police Headquarters, West Side.....	69
Woodbridge Street Police Station.....	28
Police Barns	86
Water Board Offices	132
Fire Department Headquarters, Engine No. 1.....	144
Fire Department, Telegraph Station.....	81
Engine House No. 2.....	40
Engine House No. 3.....	33
Engine House No. 6.....	38
Engine House No. 8.....	32
Engine House No. 9.....	26
Engine House No. 11.....	16
Hook and Ladder House No. 2.....	16
Hook and Ladder House No. 5.....	53
Board of Education Offices.....	163
Washington Normal School.....	71
Everett School	85
Norvell School	114
Capitol Square Fountain.....	23
Water Works Storage Grounds.....	39
House of Correction	750
G. A. R. Building.....	294
Department of Public Works, Eastern Yard.....	11
Washington Park Fountain	38
Russell School	8
Total	6,018

Belle Isle Park—

Bath House	101
Bicycle Shelter	67
Boat House	32
Detroit Boat Club	160
Casino	193
Dock	5
Park Barn	107
Police Station	48
Skating Pavilion	112
Miscellaneous	41
Yacht Club	64
	— 930
Total Lamps	6,948

*This includes 678 lamps used in decorating, and in "Welcome" signs, operated on an average of three nights a week.



Lamps and Lamp Hours Operated.

The average number of lamps operated each month, with the total lamp hours scheduled, and the lamp hours "Out" during that time, are as follows:

Twelve Months to June 30, 1901.

	Average Number Lamps.	Total Lamp Hours Scheduled.	Total Lamp Hours Out. Hrs. Min.
July	2,007	454,539	141 37
August	2,030	532,085	271 12
September	2,031	595,144	939 43
October	2,027	711,939	497 21
November	2,028	760,290	327
December	2,034	827,530	206 53
January	2,045	813,855	325 33
February	2,044	676,355	264 44
March	2,045	671,919	231 21
April	2,040	561,507	457 01
May	2,037	501,363	308 46
June	2,050	445,207	121 08
Totals	2,035	7,551,732	4,092 19

The corresponding for the 12 months ending June 30, 1900, is as follows:

Twelve Months to June 30, 1900.

	Average Number Lamps.	Total Lamp Hours Scheduled	Total Lamp Hours Out. Hrs. Min.
July	1,938	446,507	127 35
August	1,937	505,193	194 30
September	1,951	576,136	951 37
October	1,950	686,667	1,417 08
November	1,956	749,171	944 31
December	1,963	811,979	592 52
January	1,967	786,041	448 25
February	1,974	651,192	182 12
March	1,978	643,851	462 05
April	1,978	537,681	506 24
May	1,983	470,029	172 17
June	1,977	410,312	139 19
Totals	1,963	7,274,752	6,138 55

Causes of Lamp Hours Out.

The causes of "Lamp Hours Out" for the year ending June 30th, 1901, are summarized as follows:

Month.	Line.			Lamp			Trimmers'			Total.
	Trouble.	Lmps.	Hrs.	Trouble.	Lmps.	Hrs.	Neglect.	Lmps.	Hrs.	
		Lmps.	Hrs.	Min.	Lmps.	Hrs.	Min.	Lmps.	Hrs.	Min.
1900.										
July,	4	16	:30	9	30	:39	22	94	:28	35 141:37
August,	14	33	:30	50	150	:30	29	87	:12	93 271:12
Sept.,	14	118	:00	140	555	:13	66	266	:30	220 939:43
Oct.,	9	62	:21	40	237	:00	33	198	:00	82 497:21
Nov.,	6	44	:00	20	126	:30	26	156	:30	52 327:00
Dec.,	7	46	:00	30	120	:23	9	40	:30	46 206:53
1901.										
Jan.,	12	60	:06	24	222	:57	7	42	:30	43 325:33
Feb.,	11	85	:20	20	139	:06	5	40	:20	36 264:46
March	10	70	:30	17	104	:30	8	56	:21	35 231:21
April	6	24	:51	91	411	:00	7	21	:10	104 457:01
May,	7	15	:46	64	257	:00	9	36	:00	80 308:46
June,	10	50	:00	11	71	:08	..	....	:	21 121:08
Total	110	626	:54	516	2,425	:56	221	1,039	:31	847 4,092:21
1900,	42	138	:56	818	4,151	:47	498	1,848	:12	1,358 6,138:55
1899,	487	2,645	:12	200	1,196	:52	222	1,197	:39	909 5,039:43
1898,	1,479	5,606	:13	129	772	:01	214	1,087	:09	1,822 7,465:23
1897,	108	403	:02	56	358	:15	88	609	:10	242 1,371:07

Trimming Arc Lamps.

The work of trimming arc lamps is intrusted to the care of a head trimmer and 19 men. All the single carbon Adams-Bagnall lamps are located in the underground district, which is in the half-mile circle, and are trimmed daily. The balance are Brush double carbon lamps, supplied with current from overhead lines, and are trimmed every second day. These overhead lines are supplied from the station by trunk lines, one-half of which are underground through the half-mile circle.

Circuit.	Towers.	Tower Lamps.	Pole Lamps.	Cranes.	P. L. C. Mast Arms.	Center Suspensions.	Lamps in Bldgs.	Total No. of Lamps.	Miles.	Trim- mers No.
1	8	33	48	3	..	..	..	84	4.8	1
2	11	39	34	5	..	..	7	85	4.5	2
3	2	7	34	16	14	6	..	77	4.8	3
4	2	7	..	15	28	7	..	57	5.5	
6	2	6	..	22	20	7	..	55	5.3	4
5	2	6	..	38	5	8	..	57	4.7	
7	1	3	..	45	9	6	..	63	5.0	5
8	2	7	..	26	12	11	..	56	5.1	
10	2	6	..	27	10	12	..	55	4.9	6
9	2	6	..	27	17	7	..	57	4.4	
11	3	9	..	22	18	6	..	55	5.2	7
12	6	19	..	12	20	6	..	57	6.9	
14	3	9	..	25	17	6	..	57	6.3	8
13	1	3	..	40	9	2	..	54	5.8	
15	6	19	..	22	14	..	..	55	6.9	9
16	6	18	..	25	8	3	..	54	6.8	
18	4	12	..	33	2	..	..	47	7.5	10
17	1	3	..	43	3	..	..	49	9.4	
19	7	21	..	31	..	..	..	52	7.6	11
20	5	16	..	21	13	5	..	55	6.3	
22	4	13	1	23	8	8	..	53	6.5	12
21	2	6	..	24	15	9	..	54	5.9	
23	2	6	..	30	12	7	..	55	6.6	13
24	4	12	..	33	5	5	..	55	7.6	
26	8	25	..	25	..	3	..	53	7.4	14
25	4	12	..	35	6	..	..	53	6.1	
27	3	9	..	28	12	1	..	50	6.5	15
28	4	14	..	25	8	6	..	53	7.3	
30	5	15	..	29	5	6	..	55	7.8	16
29	5	15	..	28	..	10	..	53	8.5	
31	2	8	8	35	..	4	2	57	9.3	17
32	5	18	1	24	7	..	..	50	7.7	
34	6	18	..	31	..	1	..	50	8.2	18
33	4	12	..	38	..	..	..	50	8.5	
35	3	9	..	39	..	..	..	48	8.2	19
Eastern										
Market..	..	..	..	..	..	..	4	4	..	
Belle isle....2	6	43	6	..	..	13	68	..	20	

Comparative Kilowatt Hour Output..

Twelve Months to June 30, 1901.

Month.	Arc.	Incan.	Total.
July	211,355	33,804	245,159
August	247,400	36,234	283,634
September	276,737	36,012	312,749
October	327,436	41,884	369,320
November	345,624	47,046	392,670
December	376,516	47,685	424,201
January	370,298	51,690	421,988
February	307,734	41,464	349,198
March	305,707	44,526	350,233
April	257,182	40,576	297,758
May	236,917	39,348	276,265
June	212,483	37,692	250,175
Totals	3,475,389	497,961	3,973,350

Twelve Months to June 30, 1900.

Month.	Arc.	Incan.	Total.
July	205,387	28,114	233,501
August	232,381	30,694	263,075
September	264,991	34,126	299,117
October	315,870	38,194	354,064
November	340,878	43,522	384,400
December	369,451	48,632	418,083
January	357,628	50,104	407,732
February	296,284	42,581	338,865
March	292,947	41,072	334,019
April	244,645	35,308	279,953
May	216,205	35,814	252,019
June	190,786	33,436	224,222
Totals	3,327,453	461,597	3,789,050

Comparative Amount of Coal Consumed.

The total amount of coal consumed during the year, and the same reduced to the number of pounds per kilowatt hour with comparisons as follows:

Month.	—Year ending June 30, 1901.—		Year to June 30, 1900. Pounds per Kil. hr.	Year to June 30, 1899. Pounds per Kil. hr.	Year to June 30, 1898. Pounds per Kil. hr.
	Pounds coal consumed.	Pounds per Kil. hr.			
July	1,156,410	4.72	5.14	5.79	5.53
August	1,356,180	4.77	4.78	5.55	5.40
September	1,439,850	4.60	4.04	5.30	4.72
October	1,715,830	4.65	4.27	5.21	5.07
November	1,840,220	4.69	3.98	4.75	4.96
December	1,885,220	4.44	3.97	4.64	4.76
January	1,856,780	4.40	3.90	4.75	5.42
February	1,705,540	4.88	4.17	4.90	5.10
March	1,717,750	4.90	4.39	5.17	5.27
April	1,509,490	5.09	4.57	5.41	5.24
May	1,436,840	5.20	4.66	5.30	5.57
June	1,306,170	5.22	4.69	5.58	5.76
Totals	18,926,280	4.80	4.38	5.19	5.23

Year to June 30,	Lbs.
1900	16,741,070
Year to June 30,	
1899	18,166,430
Year to June 30,	
1898	17,075,525
Year to June 30,	
1897	15,032,230
Year to June 30,	
1896	13,114,531

Cost of Coal.

The prices paid per ton of 2,000 lbs. for coal, delivered on Public Lighting Commission side track, weights guaranteed, were:

Year ending June 30, 1896—Jackson Hill Lump.....	\$2.19
Year ending June 30, 1897—Jackson Hill Lump.....	2.12
Year ending June 30, 1898—Jackson Hill Lump.....	1.97
Year ending June 30, 1899—Jackson Hill Lump.....	1.97
Year ending June 30, 1900—Pocahontas Smokeless.....	1.99
Year ending June 30, 1901—West Virginia Lump.....	2.20

Inside Wiring Inspection Department.

The work of the department having in charge the inspection of inside electrical wiring and apparatus for the year ending June 30, 1901, was as follows:

Month of	Number of Applications for and Permits Issued.	Number of Approvals and Certificates Issued.	Amount of Fees Collected.	Expenses.	
July	196	200	\$ 227.05	\$ 168.62	
August	211	210	220.25	191.32	
September	267	215	236.75	177.22	
October	363	342	277.25	195.00	
November	294	320	259.00	199.50	
December	239	296	352.75	195.92	
January	212	199	179.25	205.15	
February	184	213	203.25	196.74	
March	224	199	215.50	207.77	
April	259	234	269.25	178.10	
May	253	248	231.50	173.05	
June	265	241	229.25	178.25	
<hr/>		<hr/>		<hr/>	
Totals	2,967	2,917	\$2,901.05	\$2,266.64	

Twelve Months to June 30, 1900.

Month of	Number of Applications for and Permits Issued.	Number of Approvals and Certificates Issued.	Amount of Fees Collected.	Expenses.	
July	193	207	\$ 271.00	\$ 180.82	
August	188	174	168.25	186.44	
September	332	253	332.00	200.27	
October	388	299	269.25	189.32	
November	306	296	302.00	200.07	
December	256	289	261.00	263.82	
January	198	247	196.00	204.07	
February	182	184	191.00	181.82	
March	223	233	232.95	173.32	
April	195	202	190.50	184.32	
May	244	225	226.50	169.82	
June	241	221	229.75	172.57	
<hr/>		<hr/>		<hr/>	
Totals	2,946	2,830	\$2,870.20	\$2,306.66	

Employes and Compensation.

The employes of the Public Lighting Commission on June 30, 1901, were as follows:

Executive:	Rate per Year.	Rate per day and 7 days per week.	Rate per day and 6 days per week.
1 Secretary	\$1,200.00	....	....
1 General Supt.....	2,000.00	....	....
1 Assistant General Supt.....	1,200.00	....	....
1 Storekeeper	420.00	....	....
1 Superintendent's clerk	600.00	....	....
1 Janitor .....	....	....	\$1.60
1 Draughtsman	660.00	....	....
<hr/>			
	7		

Inspection Department:

1 Inspector	\$1,350.00	....	....
1 Permit clerk	720.00	....	....
<hr/>			
	2		

Station:

1 First engr. and machinist..	....	\$3.00	....
2 First engineers, each.....	....	3.00	....
3 Second engineers, each.....	....	2.00	....
7 Firemen, each .....	....	1.75	....
1 Coal passer .....	....	1.75	....
6 Oilers, each .....	....	1.75	....
1 Handy man	720.00	....	....
3 Operating electricians, each.	2.50
3 Switch tenders, each.....	1.50
6 Laborers, each	1.50
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Lighting:

1 Head trimmer	900.00
19 Trimmers, each	2.00
2 Patrolmen with horse and buggy, each	3.25
1 Patrolman	3.25
1 Belle Isle man.....	900.00
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Employees and Compensation—Continued.

Maintenance and Repairs:	Rate per Year.	Rate per day and 7 days per week.	Rate per day and 6 days per week.
1 Blacksmith	2.50
1 Blacksmith's helper	1.00
1 Carpenter	2.25
1 Painter	2.00
1 Lathe man	2.50
1 Steamfitter	2.75
1 Foreman lamp and cable department	2.50
2 Helpers in lamp room, each.	2.00
1 Helper in lamp room.....	1.50
1 Apprentice in lamp room...	1.00
1 Apprentice in lamp room...50
1 Conduit man	2.50
1 Conduit helper.....	1.50
1 Line foreman	3.00
4 Linemen, each	2.50
1 Line gang helper.....	1.75
1 Wireman	2.50
5 Laborers, each	1.50

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Total employees, 92

One day's work consists of 8 hours, proportionate wages for overtime.
Employees paid by the yearly rate are allowed no overtime.

Comparative Cash Cost of an Arc Light.

The year's operating expenses can be divided between the arc and the incandescent in proportion to the electrical output. That chargeable to arc lighting would be \$86,675.58, which amount reduced to the cost of an arc lamp for one year shows the following relative figures:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 4.85	\$ 2.95	\$ 7.80
Executive	2.93	.49	3.42
Station	9.21	9.81	19.02
Lighting	7.80	4.41	12.21
Shop supplies .....	....	.05	.05
Surgeon and hospital.....	.02	.07	.09
 Totals	 \$24.81	 \$17.78	 \$42.59

The corresponding figures for the twelve months ending June 30, 1900, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 4.51	\$ 1.96	\$ 6.47
Executive	3.27	.46	3.73
Station	9.38	8.25	17.63
Trimming	7.33	4.88	12.21
Shop .....	....	.06	.06
Injuries and damages.....	.06	.14	.20
 Totals	 \$24.55	 \$15.75	 \$40.30

The corresponding figures for the twelve months ending June 30, 1899, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 5.87	\$ 2.50	\$ 8.37
Executive	3.56	.37	3.93
Station	10.32	9.51	19.83
Trimming	10.20	3.91	14.11
Shop .....	....	.05	.05
Injuries and damages.....	.03	.14	.17
 Totals	 \$29.98	 \$16.48	 \$46.46
Twelve months to June 30, '98.	\$33.27	\$18.58	\$51.85
Twelve months to June 30, '97.	43.57	20.62	64.19

Comparison of Operating Disbursements.

The operating disbursements for the year ending June 30, 1901, in the various departments, if partitioned between wages and stores, will show the following division on the basis of each \$100.00 expended:

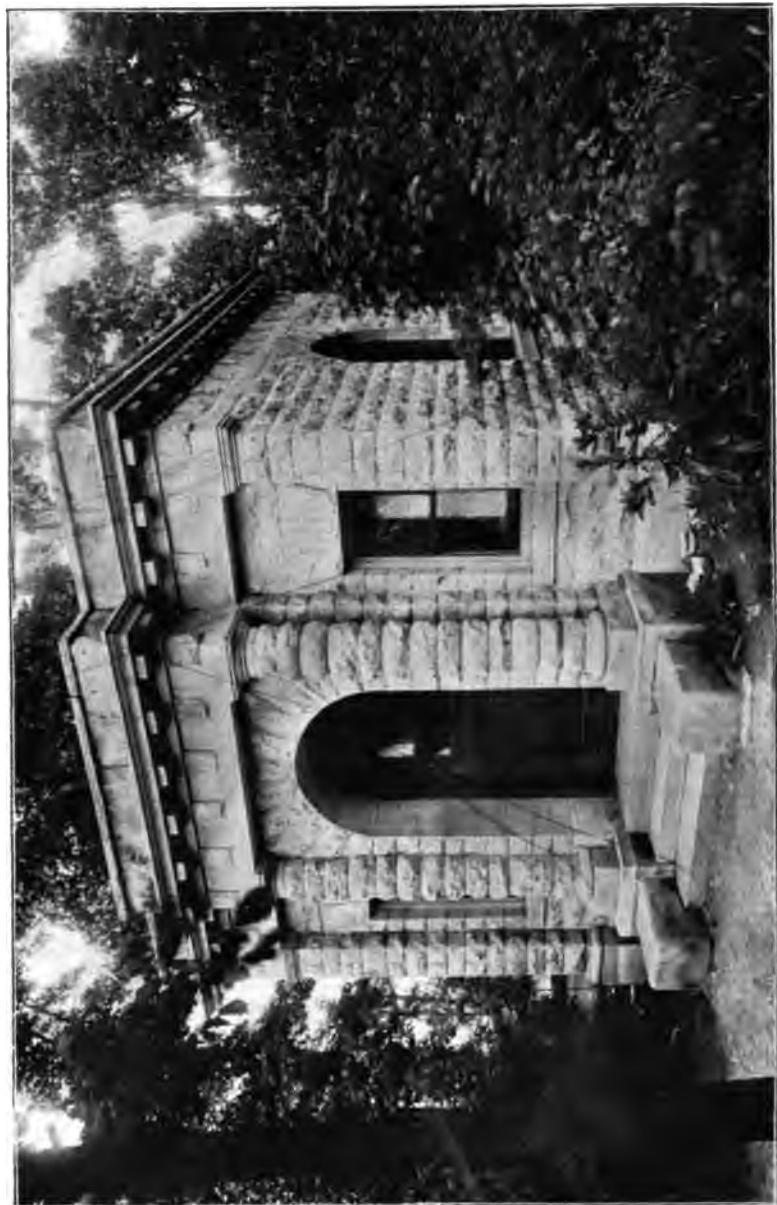
Department.	Wages.	Stores.	Total.
Maintenance	\$11.38	\$ 6.92	\$18.31
Executive	6.89	1.16	8.05
Station	21.62	23.04	44.66
Trimming	18.29	10.36	28.65
Shop .....	....	.11	.11
Injuries and damages.....	.05	.17	.22
 Totals	 \$58.24	 \$41.76	 \$100.00

The corresponding figures for the twelve months ending June 30, 1900, are:

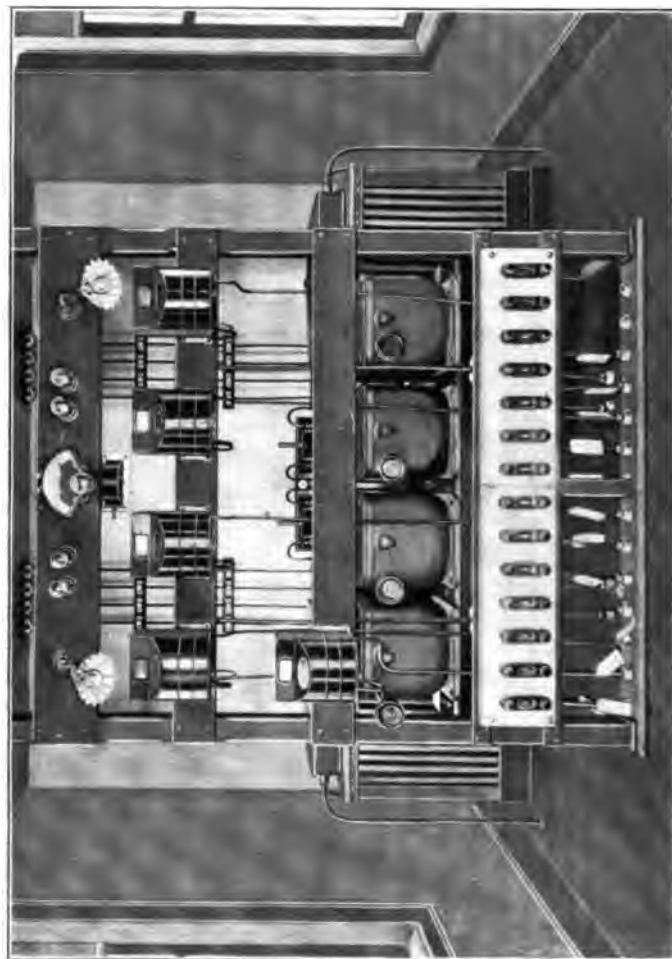
Department.	Wages.	Stores.	Total.
Maintenance	\$11.18	\$ 4.87	\$ 16.05
Executive	8.11	1.13	9.24
Station	23.28	20.47	43.75
Trimming	18.21	12.11	30.32
Shop .....	....	.15	.15
Injuries and damages.....	.16	.33	.49
 Totals	 \$60.94	 \$39.06	 \$100.00

The corresponding figures for the twelve months ending June 30, 1899, are:

Department.	Wages.	Stores.	Total.
Maintenance	\$12.57	\$ 5.44	\$ 18.01
Executive	7.65	.81	8.46
Station	22.21	20.46	42.67
Trimming	21.95	8.41	30.36
Shop .....	....	.12	.12
Injuries and damages.....	.06	.32	.38
 Totals	 \$64.44	 \$35.56	 \$100.00
 Year ending June 30, 1898....	 \$64.16	 \$35.84	 \$100.00
 Year ending June 30, 1897....	 67.89	 32.11	 100.00



TRANSFORMER HOUSE—BELLE ISLE PARK.



INTERIOR TRANSFORMER HOUSE—BELLE ISLE PARK.

Cash Cost of Operation—July, 1900.

Output this month.. 245,149 K. W. Hours
 Output July. 1899... 233,501 K. W. Hours

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....\$ 78.00	\$ 24.11	\$ 102.11		....
Steam plant	106.26	129.84	236.10	....
Electric plant	29.97	9.03	39.00	....
Miscel. tools and mach'y....	82.16	24.87	107.03	....
Conduits	15.25	....	15.25	....
Towers and lamp posts....	192.71	90.06	282.77	....
Arc lamps	247.30	70.70	318.00	....
Lines and cables.....	351.26	35.95	387.21	....
 Total maintenance	<u>\$1,102.91</u>	<u>\$ 384.56</u>	<u>\$1,487.47</u>	<u>.00607</u>
Executive:				
Salary Sec'y and City Elec..\$ 266.66	....	\$ 266.66		...
Printing and stationery.....	....	\$ 17.13	17.13	....
Store room	75.00	....	75.00	....
Office	95.00	15.54	110.54	....
Superintendence	150.00	....	150.00	....
 Total executive	<u>\$ 586.66</u>	<u>\$ 32.67</u>	<u>\$ 619.33</u>	<u>.00253</u>
Station:				
Oils .....	....	\$ 78.49	\$ 78.49	.00032
Waste .....	....	19.43	19.43	.00008
Coal .....	....	1,158.38	1,158.38	.00473
Miscellaneous supplies .....	....	84.37	84.37	.00034
Wages	<u>\$1,787.75</u>	....	<u>1,787.75</u>	<u>.00729</u>
 Total station	<u>\$1,787.75</u>	<u>\$1,340.67</u>	<u>\$3,128.42</u>	<u>.01267</u>
Ligting:				
Trimming and patrolling....\$1,320.49	....	\$1,320.49		....
Carbons .....	....	\$ 434.42	434.42	....
Incandescent renewals .....	....	89.30	89.30	....
Incand. lighting expense....	5.11	.21	5.32	....
Globes and nets.....	....	77.09	77.09	....
Miscellaneous supplies .....	....	.49	.49	....
Belle Isle Park.....	84.43	9.52	93.95	....
 Total lighting	<u>\$1,410.03</u>	<u>\$ 611.03</u>	<u>\$2,021.06</u>	<u>.00824</u>
Shop supplies .....	....	\$ 3.10	\$ 3.10	.00001
Surgeon and hospital.....	....	....	....	.00000
 Total operating expense..	<u>\$4,887.35</u>	<u>\$2,372.03</u>	<u>\$7,259.38</u>	<u>.02961</u>
July. 1899, was.....\$4,159.64	\$2,144.93	\$6,404.67	.02743	
July, 1898, was..... 5,173.50	2,566.39	7,739.89	.03689	
July, 1897, was..... 5,952.55	2,525.20	8,477.75	.04522	

Cash Cost of Operation—August, 1900.

Output this month, 283,634 K. W. Hours.

Output August, 1899, 263,075 K. W. Hours.

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....	\$ 43.70	\$ 924.89	\$ 968.59	....
Steam plant	100.11	145.19	245.30	....
Electric plant	30.70	1.38	32.08	....
Miscel. tools and mach'y....	109.03	31.53	140.56	....
Conduits .....	.87	1.20	2.07	....
Towers and lamp posts....	213.56	96.86	310.42	....
Arc lamps	318.03	78.61	396.64	....
Lines and cables.....	286.56	117.94	404.50	....
 Total maintenance	 \$1,102.56	 \$1,397.60	 \$2,500.16	 .00882	
Executive:					
Salary Sec'y and City Elec..	\$ 266.66	....	\$ 266.66	....
Printing and stationery.....	....	\$ 91.43	91.43	....
Store room	80.98	....	80.98	....
Office	85.20	32.90	118.10	....
Superintendence and drafting	154.00	8.00	162.00	....
 Total executive	 \$ 586.84	 \$ 132.33	 \$ 719.17	 .00253	
Station:					
Oils .....	....	\$ 82.36	\$ 82.36	.00029	
Waste .....	....	19.74	19.74	.00007	
Coal .....	....	1,463.92	1,463.92	.00516	
Miscellaneous supplies .....	....	96.45	96.45	.00034	
Wages	\$1,803.68	....	1,803.68	.00636	
 Total station	 \$1,803.68	 \$1,662.47	 \$3,466.15	 .01222	
Lighting:					
Trimming and patrolling....	\$1,324.78	....	\$1,324.78	....
Carbons .....	....	\$ 553.09	553.09	....
Incand. renewals .....	....	91.56	91.56	....
Incand. lighting expense....	8.23	....	8.23	....
Globes and nets.....	....	90.41	90.41	....
Miscellaneous supplies .....	....	49.02	49.02	....
Belle Isle Park.....	86.12	....	86.12	....
 Total lighting	 \$1,419.13	 \$ 784.08	 \$2,203.21	 .00777	
Shop supplies .....	....	\$ 10.28	\$ 10.28	.00003	
Surgeon and hospital.....	\$ 17.50	95.75	113.25	.00040	
 Total operating expense..	 \$4,929.71	 \$4,082.51	 \$9,012.22	 .03177	
August, 1899, was.....	\$4,564.43	\$2,546.77	\$7,111.20	.02703	
August, 1898, was.....	5,223.47	2,885.42	8,108.89	.03287	
August, 1897, was.....	5,350.85	2,661.68	8,012.53	.03784	

Cash Cost of Operation—September, 1900.

Output for this month.... 312,749 K. W. Hours

Output September, 1899.. 299,117 K. W. Hours

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....\$ 25.01	....		\$ 25.01	....
Steam plant	97.48	\$ 121.71	219.19	....
Electric plant	34.71	11.35	46.06	....
Miscel. tools and mach'y....	71.87	61.40	133.27	....
Conduits	27.12	.87	27.99	....
Towers and lamp posts.....	227.14	164.99	392.13	....
Arc lamps	224.54	79.59	304.13	....
Lines and cables	462.52	167.60	630.12	....
 Total maintenance	<u>\$1,170.39</u>	<u>\$ 607.51</u>	<u>\$1,777.90</u>	<u>.00569</u>	
Executive:					
Salary Sec'y and City Elec..\$ 266.66	....		\$ 266.66	....
Printing and stationery.....	....	\$ 8.93	8.93	....
Store room	75.37	....	75.37	....
Office	64.00	13.45	77.45	....
Superintendence and drafting	150.00	12.90	162.90	....
 Total executive	<u>\$ 556.03</u>	<u>\$ 35.28</u>	<u>\$ 591.31</u>	<u>.00189</u>	
Station:					
Oils .....	....	\$ 80.69	\$ 80.69	.00026	
Waste .....	....	19.11	19.11	.00006	
Coal .....	....	1,583.84	1,583.84	.00507	
Miscellaneous supplies .....	....	102.08	102.08	.00031	
Wages	<u>\$1,724.98</u>	....	<u>1,724.98</u>	<u>.00552</u>	
 Total station	<u>\$1,724.98</u>	<u>\$1,785.72</u>	<u>\$3,510.70</u>	<u>.01122</u>	
Lighting:					
Trimming and patrolling...\$1,301.48	....		\$1,301.48	...	
Carbons .....	....	\$ 699.37	699.37	...	
Incand. renewals .....	....	112.66	112.66	....
Incand. lighting expense....	19.75	.44	20.19	....
Globes and nets.....	....	71.53	71.53	....
Miscellaneous supplies .....	....	31.83	31.83	....
Belle Isle Park.....	83.13	9.37	92.50	...	
 Total lighting	<u>\$1,404.36</u>	<u>\$ 925.20</u>	<u>\$2,329.56</u>	<u>.00745</u>	
Shop supplies .....	....	\$ 3.06	\$ 3.06	.00001	
Surgeon and hospital.....	....	21.00	21.00	.00007	
 Total operating expense..\$4,855.76	<u>\$3,377.77</u>	<u>\$8,233.53</u>	<u>.02633</u>		
September, 1899, was.....\$4,437.81		\$2,676.14	\$7,113.95	.02378	
September, 1898, was..... 5,089.36		2,775.18	7,864.54	.02833	
September, 1897, was..... 5,363.06		3,012.72	8,375.78	.03459	

Cash Cost of Operation—October, 1900.

Output this month..... 369,320 K. W. Hours
 Output October, 1899.. 354,064 K. W. Hours

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....	\$ 27.52	\$ 77.92	\$ 105.44	....
Steam plant	103.00	117.82	220.82	....
Electric plant	24.84	261.55	286.39	....
Miscl. tools and mach'y....	45.46	10.87	56.33	....
Conduits	19.95	....	19.95	....
Towers and lamp posts.....	211.90	61.40	273.30	....
Arc lamps	149.07	53.09	202.16	....
Lines and cables.....	452.71	35.17	487.88	....
 Total maintenance	\$1,034.45	\$ 617.82	\$1,652.27	.00448	
Executive:					
Salary Sec'y and City Elec..	\$ 266.66	....	\$ 266.66	....
Printing and stationery.....	....	\$ 485.51	485.51	....
Store room	89.13	....	89.13	....
Office	65.90	11.55	77.45	....
Superintendence and drafting	153.50	59.00	212.50	....
 Total executive	\$ 579.19	\$ 556.06	\$1,131.25	.00306	
Station:					
Oils .....	....	\$ 67.40	\$ 67.40	.00018	
Waste .....	....	20.13	20.13	.00005	
Coal .....	....	1,887.41	1,887.41	.00511	
Miscellaneous supplies .....	....	101.00	101.00	.00028	
Wages	\$1,841.01	....	1,841.01	.00498	
 Total station	\$1,841.01	\$2,075.94	\$3,916.95	.01060	
Lighting:					
Trimming and patrolling....	\$1,379.47	....	\$1,379.47	....
Carbons .....	....	\$ 839.69	839.69	....
Incand. renewals .....	....	145.96	145.96	....
Incand. lighting expense....	28.87	7.09	35.96	....
Globes and nets.....	....	78.84	78.84	....
Miscellaneous supplies .....	....	28.03	28.03	....
Belle Isle Park.....	109.31	2.60	111.91	....
 Total lighting	\$1,517.65	\$1,102.21	\$2,619.86	.00710	
Shop supplies .....	....	\$ 5.08	\$ 5.08	.00001	
Surgeon and hospital.....	\$ 7.87	2.00	9.87	.00003	
 Total operating expense..	\$4,976.17	\$4,359.11	\$9,335.28	.02528	
October, 1899, was.....	\$4,558.39	\$3,260.89	\$7,819.28	.02208	
October, 1898, was.....	5,536.87	3,244.40	8,781.27	.02698	
October, 1897, was.....	5,208.90	3,091.68	8,300.67	.02824	

Cash Cost of Operation—November, 1900.

	Output this month.....	392,670 K. W. Hours	Output November, 1899..	384,400 K. W. Hours	Cost
	Wages.	Stores.	Total.	per K. W.	Hour.
Maintenance:					
Bldgs., track, dock, etc.....	\$ 30.61	\$ 19.52	\$ 50.13	....
Steam plant	85.20	191.95	277.15	....
Electric plant	40.56	9.29	49.85	....
Miscel. tools and mach'y....	51.75	54.13	105.88	....
Conduits	21.13	.84	21.97	....
Towers and lamp posts.....	93.79	287.87	381.66	....
Arc lamps	173.83	55.64	229.47	....
Lines and cables.....	453.13	176.43	629.56	....
 Total maintenance	 \$ 950.00	 \$ 795.67	 \$1,745.67	 .00444	
Executive:					
Salary Sec'y and City Elec..	\$ 266.66	....	\$ 266.66	....
Printing and stationery.....	....	\$ 40.90	40.90	....
Store room	76.46	....	76.46	....
Office	64.60	15.78	80.38	....
Superintendence and drafting	155.00	2.90	157.90	....
 Total executive	 \$ 562.72	 \$ 59.58	 \$ 622.30	 .00159	
Station:					
Oils .....	....	\$ 65.72	\$ 65.72	.00017	
Waste .....	....	19.01	19.01	.00005	
Coal .....	....	2,024.24	2,024.24	.00515	
Miscellaneous supplies .....	....	111.06	111.06	.00028	
Wages	\$1,777.31	....	1,777.31	.00453	
 Total station	 \$1,777.31	 \$2,220.03	 \$3,997.34	 .01018	
Lighting:					
Trimming and patrolling....	\$1,431.33	....	\$1,431.33	....
Carbons .....	....	\$ 742.89	742.89	....
Incand. renewals .....	....	170.38	170.38	....
Incand. lighting expense....	24.07	18.58	42.65	....
Globes and nets.....	....	90.13	90.13	....
Miscellaneous supplies .....	....	19.14	19.14	....
Belle Isle Park.....	86.36	9.37	95.73	....
 Total lighting	 \$1,541.76	 \$1,050.49	 \$2,592.25	 .00660	
Shop supplies .....	....	\$ 15.26	\$ 15.26	.00004	
Surgeon and hospital.....	....	3.40	3.40	.00001	
 Total operating expense..	 \$4,831.79	 \$4,144.43	 \$8,976.22	 .02286	
November, 1899, was.....	\$4,669.91	\$3,297.93	\$7,967.84	.02073	
November, 1898, was.....	5,503.55	3,323.44	8,826.99	.02455	
November, 1897, was.....	5,125.03	3,265.06	8,390.09	.02490	

Cash Cost of Operation—December, 1900.

Output this month..... 424,201 K. W. Hours
 Output December, 1899.. 418,083 K. W. Hours

	Wages.	Stores.	Total.	per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....	\$ 19.70	\$ 5.14	\$ 24.84	....
Steam plant	100.98	177.09	278.07	....
Electric plant	68.90	3.53	72.43	....
Miscel. tools and mach'y.....	30.67	6.43	37.10	....
Conduits	20.00	8.62	28.62	....
Towers and lamp posts.....	171.68	29.48	201.16	....
Arc lamps	224.84	38.94	263.78	....
Lines and cables.....	417.54	454.58	872.12	....
 Total maintenance	\$1,054.31	\$ 723.81	\$1,778.12	.00419	
Executive:					
Salary Sec'y and City Elec..	\$ 266.66	....	\$ 266.66	....
Printing and stationery.....	....	\$ 17.11	17.11	....
Store room	91.16	2.12	93.28	....
Office	64.00	4.78	68.78	....
Superintendence and drafting.	155.00	....	155.00	....
 Total executive	\$ 576.82	\$ 24.01	\$ 600.83	.00142	
Station:					
Oils .....	....	\$ 73.05	\$ 73.05	.00017	
Waste .....	....	22.23	22.23	.00005	
Coal .....	....	2,099.87	2,099.87	.00495	
Miscellaneous supplies .....	....	77.72	77.72	.00019	
Wages	\$1,860.94	....	1,860.94	.00439	
 Total station	\$1,860.94	\$2,272.87	\$4,133.81	.00975	
Lighting:					
Trimming and patrolling.....	\$1,441.85	....	\$1,441.85	....
Carbons .....	....	\$ 765.66	765.66	....
Incand. lamp renewals.....	....	161.45	161.45	....
Incand. lighting expense....	28.21	3.17	31.38	....
Globes and nets.....	....	51.76	51.76	....
Miscellaneous .....	....	8.20	8.20	....
Belle Isle Park.....	76.75	....	76.75	....
 Total lighting	\$1,546.81	\$ 990.24	\$2,537.05	.00598	
Shop supplies .....	....	\$ 1.97	\$ 1.97	....
Surgeon and hospital.....	....	26.00	26.00	.00006	
 Total operating expense...\$5,038.88	\$4,038.90	\$9,077.78	.02140		
December, 1899, was.....	\$4,648.81	\$3,234.26	\$7,883.07	.01885	
December, 1898, was.....	5,783.62	3,195.68	8,979.30	.02323	
December, 1897, was.....	5,339.33	3,398.78	8,738.11	.02338	

Cash Cost of Operation—January, 1901.

Output this month..... 421,988 K. W. Hours
 Output January, 1900.. 407,732 K. W. Hours

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....\$ 42.15	\$ 50.94	\$ 93.09	.....
Steam plant 115.75	133.21	248.96	.....
Electric plant 41.90	159.70	201.60	.....
Miscel. tools and mach'y.... 58.51	47.32	105.83	.....
Conduits 43.00	21.81	64.81	.....
Towers and lamp posts..... 63.50	15.50	79.00	.....
Arc lamps 166.88	38.67	205.55	.....
Lines and cables..... 345.11	94.67	439.78	.....
 Total maintenance	\$ 876.80	\$ 561.82	\$1,438.62	.00341
Executive:				
Salary Sec'y and City Elec.. \$ 266.66	.....	266.66	.....
Printing and stationery.....	21.03	21.03	.....
Store room 87.90	3.00	90.90	.....
Office 66.00	27.44	93.44	.....
Superintendence and drafting. 155.00	1.00	156.00	.....
 Total executive.....\$ 575.56	\$ 52.47	\$ 628.03	.00149	
Station:				
Oils	\$ 76.02	\$ 76.02	.00018	
Waste	19.33	19.33	.00004	
Coal	2,087.54	2,087.54	.00495	
Miscellaneous supplies	137.97	137.97	.00033	
Wages 1,874.48	....	1,874.48	.00444	
 Total station	\$1,874.48	\$2,320.86	\$4,195.34	.00994
Lighting:				
Trimming and patrolling....\$1,462.06	....	\$1,462.06	.....
Carbons	\$ 784.01	784.01	.....
Incand. lamp renewals.....	92.19	92.19	.....
Incand. lighting expense.... 24.55	1.64	26.19	.....
Globes and nets.....	23.49	23.49	.....
Miscellaneous supplies	10.94	10.94	.....
Belle Isle Park..... 87.56	....	87.56	.....
 Total lighting	\$1,574.17	\$ 912.27	\$2,486.44	.00589
Shop supplies	\$ 22.10	\$ 22.10	.00005	
Surgeon and hospital.....	....	....	....	....
 Total operating expense...\$4,901.01	\$3,869.52	\$8,770.53	.02078	
January, 1900, was.....\$4,776.83	\$3,344.21	\$8,121.04	.01991	
January, 1899, was..... 5,624.41	3,226.30	8,850.71	.02316	
January, 1898, was..... 5,462.29	3,634.15	9,096.44	.02517	

Cash Cost of Operation—February, 1901.

Output this month, 349,198 K. W. Hours.

Output February, 1900, 338,865 K. W. Hours.

				Cost per K. W. Hour.
Maintenance:	Wages.	Stores.	Total.	
Bldgs., track, dock, etc.....	\$ 61.02	\$ 21.89	\$ 82.91	....
Steam plant	59.02	68.45	127.47	....
Electric plant	79.69	.75	80.44	....
Miscel. tools and mach'y....	58.72	5.74	64.46	....
Conduits	78.58	3.00	81.58	....
Towers and lamp posts.....	6.41	5.00	11.41	....
Arc lamps	206.84	30.13	236.97	....
Lines and cables.....	289.82	66.34	356.16	....
 Total maintenance	 \$ 840.10	 \$ 201.30	 \$1,041.40	 .00299
Executive:				
Salary Sec'y and City Elec..	\$ 266.66	....	266.66	....
Printing and stationery.....	....	\$ 38.29	38.29	....
Store room	78.03	.25	78.28	....
Office	62.60	4.22	66.82	....
Superintendence and drafting.	155.00	3.00	158.00	....
 Total executive	 \$ 562.29	 \$ 45.76	 \$ 608.05	 .00174
Station:				
Oils .....	....	\$ 64.51	\$ 64.51	.00019
Waste .....	....	19.81	19.81	.00006
Coal .....	....	1,876.09	1,876.09	.00537
Miscellaneous supplies .....	....	20.42	20.42	.00006
Wages	1,658.35	....	1,658.35	.00475
 Total station	 \$1,658.35	 \$1,980.83	 \$3,639.18	 .01043
Lighting:				
Trimming and patrolling....	\$1,329.61	\$ 13.00	\$1,342.61	....
Carbons .....	....	684.41	684.41	....
Incand. lamp renewals.....	....	164.32	164.32	....
Incand. lighting expense....	27.56	2.20	29.76	....
Globes and nets.....	....	36.71	36.71	....
Miscellaneous supplies .....	....	4.16	4.16	....
Belle Isle Park.....	78.87	....	78.87	....
 Total lighting	 \$1,436.04	 \$ 904.80	 \$2,340.84	 .00670
Shop supplies .....	....	\$ 6.08	\$ 6.08	.00002
Surgeon and hospital.....	....	....	....	....
 Total operating expense...	 \$4,496.78	 \$3,138.77	 \$7,635.55	 .02188
February, 1900, was.....	\$4,370.85	\$2,985.78	\$7,329.63	.02163
February, 1899, was.....	5,249.31	2,701.34	7,950.65	.02490
February, 1898, was.....	5,152.92	3,166.43	8,319.35	.02731
February, 1897, was.....	6,122.85	2,644.71	8,767.56	.03243

Cash Cost of Operation—March, 1901.

Output this month.... 350,233 K. W. Hours
 Output March, 1900.. 334,019 K. W. Hours

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 51.27	\$ 26.08	\$ 77.35	.....
Steam plant	91.15	253.39	344.54	.....
Electric plant	151.57	22.18	173.75	.....
Miscel. tools and mach'y....	34.42	10.34	44.76	.....
Conduits	15.00	.50	15.50	.....
Towers and lamp posts....	85.84	20.30	106.14	.....
Arc lamps	199.59	53.96	253.55	.....
Lines and cables.....	270.18	99.04	369.22	.....
 Total maintenance	 \$ 899.02	 \$ 485.79	 \$1,384.81	 .00396
Executive:				
Salary Sec'y and City Elec..	\$ 266.66	.....	\$ 266.66	.....
Printing and stationery.....	....	\$ 79.53	79.53	.....
Store room	90.60	.....	90.60	.....
Office	66.00	17.05	83.05	.....
Superintendence and drafting	155.00	2.50	157.50	.....
 Total executive	 \$ 578.26	 \$ 99.08	 \$ 677.34	 .00193
Station:				
Oils .....	....	\$ 69.63	\$ 69.63	.00019
Waste .....	....	22.68	22.68	.00006
Coal .....	....	1,889.53	1,889.53	.00540
Miscellaneous supplies .....	....	154.83	154.83	.00044
Wages	\$1,816.61	....	1,816.61	.00519
 Total station	 \$1,816.61	 \$2,136.67	 \$3,953.28	 .01128
Lighting:				
Trimming and patrolling...	\$1,476.85	....	\$1,476.85	.....
Carbons .....	....	\$ 712.05	712.05	.....
Incand. lamp renewals.....	....	88.61	88.61	.....
Incand. lighting expense....	34.83	2.85	37.68	.....
Globes and nets.....	....	34.43	34.43	.....
Miscellaneous supplies .....	....	16.28	16.28	.....
Belle Isle Park.....	90.74	12.84	103.58	.....
 Total lighting	 \$1,602.42	 \$ 867.06	 \$2,469.48	 .00705
Shop supplies .....	....	\$ 22.53	\$ 22.53	.00007
Surgeon and hospital.....	....	....	....	....
 Total operating cost.....	 \$4,896.31	 \$3,611.13	 \$8,507.44	 .02429
March, 1900, was.....	\$4,777.63	\$3,320.28	\$8,097.91	.02424
March, 1899, was.....	5,545.67	3,107.43	8,653.10	.02742
March, 1898, was.....	5,678.90	3,444.40	9,123.30	.03050
March, 1897, was.....	6,221.01	3,241.21	9,462.22	.03541

Cash Cost of Operation—April, 1901.

Output this month, 297,758 K. W. Hours.
Output April, 1900, 279,953 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K. W. Hour.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 30.52	\$ 2.50	\$ 33.02	....
Steam plant	37.82	76.58	114.40	....
Electric plant	52.56	81.73	134.29	....
Miscel. tools and mach'y....	36.96	12.00	48.96	....
Conduits	28.93	3.40	32.33	....
Towers and lamp posts.....	32.25	10.71	42.96	....
Arc lamps	186.20	81.15	267.35	....
Lines and cables.....	462.15	162.46	624.61	....
Total maintenance	<u>\$ 867.39</u>	<u>\$ 430.53</u>	<u>\$1,297.92</u>	<u>.00436</u>
Executive:				
Salary Sec'y and City Elec..	\$ 295.63	....	\$ 295.63	....
Printing and stationery.....	....	\$ 32.68	32.68	....
Store room	51.49	....	51.49	....
Office	65.00	15.86	80.86	....
Superintendence and drafting	155.00	....	155.00	....
Total executive	<u>\$ 567.12</u>	<u>\$ 48.54</u>	<u>\$ 615.66</u>	<u>.00207</u>
Station:				
Oils .....	....	\$ 74.07	\$ 74.07	.00025
Waste .....	....	19.81	19.81	.00007
Coal .....	....	\$1,660.44	\$1,660.44	.00555
Miscellaneous supplies .....	....	64.41	64.41	.00022
Wages	\$1,745.93	....	1,745.93	.00587
Total station	<u>\$1,745.93</u>	<u>\$1,818.73</u>	<u>\$3,564.66</u>	<u>.01196</u>
Lighting:				
Trimming and patrolling...\$1,421.96	\$ 12.25	\$1,434.21	....
Carbons	578.66	578.66	....
Incand. lamp renewals.....	88.77	88.77	....
Incand. lighting expense....	16.91	22.81	39.72	....
Globes and nets.....	....	39.10	39.10	....
Miscellaneous supplies .....	....	2.43	2.43	....
Belle Isle Park.....	101.82	16.27	118.09	....
Total lighting	<u>\$1,540.69</u>	<u>\$ 760.29</u>	<u>\$2,300.98</u>	<u>.00773</u>
Shop supplies .....	....	\$ 9.02	\$ 9.02	.00003
Surgeon and hospital .....	....	....	....	....
Total operating cost.....	<u>\$4,721.13</u>	<u>\$3,067.11</u>	<u>\$7,788.24</u>	<u>.02615</u>
April, 1900, was.....	\$4,458.19	\$2,727.78	\$7,185.97	.02567
April, 1899, was.....	4,898.82	2,656.34	7,555.16	.02916
April, 1898, was.....	5,174.66	2,798.64	7,973.30	.03198
April, 1897, was.....	6,007.51	2,662.92	8,670.43	.03928

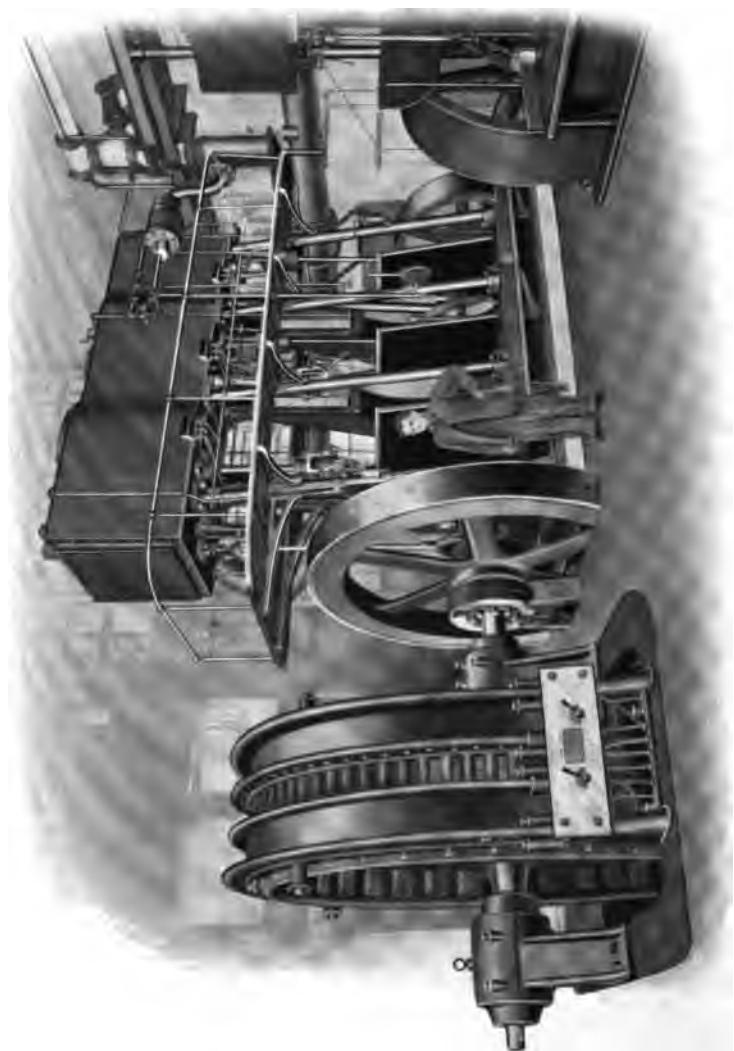
Cost of Operation—May, 1901.

Output this month, 276,265 K. W. Hours.
Output May, 1900, 252,019 K. W. Hours.

	Wages.	Stores.	Total.	Per K. W. Hour.	Cost
Maintenance:					
Bldgs., track, dock, etc.....\$	55.03	.70	\$ 55.73	....
Steam plant	61.21	26.41	87.62	....
Electric plant	18.10	....	18.10	....
Miscl. tools and mach'y....	57.19	12.92	70.11	....
Conduts	57.12	28.59	85.71	....
Towers and lamp posts....	17.43	1.90	19.33	....
Arc lamps	173.31	79.48	252.79	....
Lines and cables.....	400.75	84.44	485.19	....
 Total maintenance	 \$ 840.14	 \$ 234.44	 \$1,074.58	 .00389	
Executive:					
Saly. Sec'y and City Elect...\$	266.66	\$ 10.00	\$ 276.66	....
Printing and stationery.....	....	7.93	7.93	....
Store room	60.10	....	60.10	....
Office	65.60	6.21	71.81	....
Superintendence and drafting	155.00	.75	155.75	....
 Total executive	 \$ 547.36	 \$ 24.89	 \$ 572.25	 .00207	
Station:					
Oils	\$	\$ 72.68	\$ 72.68	.00026	
Waste .....	....	21.60	21.60	.00007	
Coal .....	....	1,564.08	1,564.08	.00566	
Miscellaneous supplies .....	....	45.89	45.89	.00017	
Wages	\$1,835.35	....	1,835.35	.00665	
 Total station	 \$1,835.35	 \$1,704.25	 \$3,539.60	 .012.81	
Lighting:					
Trimming and patrolling....\$	1,453.38	\$ 1.50	\$1,454.88	....
Carbons .....	....	532.64	532.64	....
Incand. lamp renewals.....	....	71.85	71.85	....
Incand. ltg. expense.....	11.87	1.80	13.67	....
Globes and nets.....	....	52.72	52.72	....
Misc. supplies .....	....	1.02	1.02	....
Belle Isle Park.....	140.84	19.74	160.58	....
 Total lighting	 \$1,606.09	 \$ 681.27	 \$2,287.36	 .00828	
Shop supplies .....	....	3.90	3.90	.00001	
Surgeon and hospital.....	....	....	....	....
 Total operating cost.....\$	 4,828.94	 \$2,648.75	 \$7,477.69	 .02706	
May, 1900, was.....\$	4,514.57	\$2,804.71	\$7,319.28	.02904	
May, 1899, was.....	4,531.61	2,553.57	7,085.18	.02951	
May, 1898, was.....	5,195.46	2,585.75	7,781.21	.03476	
May, 1897, was.....	5,658.29	2,377.02	8,035.31	.04102	

Cash Cost of Operation—June, 1901.

	Output June, 1901..	250,175 K. W. Hours	Output June, 1900..	224,222 K. W. Hours	Cost	Per K. W.
Maintenance:						
Bldgs., track, dock, etc.....	\$ 88.39	\$ 11.09	\$ 99.48	....	
Steam plant	107.09	46.47	153.56	....	
Electric plant	21.73	260.81	282.54	....	
Misc. tools and mach'y.....	45.02	16.31	61.33	....	
Conduits	3.37	.20	3.57	....	
Towers and lamp posts.....	19.19	....	19.19	....	
Arc lamps	128.01	52.44	180.45	....	
Lines and cables.....	137.80	26.90	164.70	....	
Total maintenance	\$ 550.60	\$ 414.22	\$ 964.82	.00386		
Executive:						
Saly. Sec'y and City Elect...	\$ 266.66	\$	\$ 266.66	....	
Printing and stationery.....	....	14.50	14.50	....	
Store room	57.50	....	57.50	....	
Office expense	71.20	23.90	95.10	....	
Supt. and draughting.....	155.00	.70	155.70	....	
Total executive	\$ 550.36	\$ 39.10	\$ 589.46	.00235		
Station:						
Oils	\$	\$ 67.98	\$ 67.98	.00027		
Waste .....	....	22.40	22.40	.00009		
Coal .....	....	1,409.10	1,409.10	.00563		
Miscellaneous supplies .....	....	15.59	15.59	.00007		
Wages	1,695.59	....	1,695.59	.00678		
Total station	\$ 1,695.59	\$ 1,515.07	\$ 3,210.66	.01284		
Lighting:						
Trimming and patrolling....	\$ 1,400.26	\$	\$ 1,400.26	....	
Carbons .....	....	506.63	506.63	....	
Incand. lamp renewals.....	....	89.29	89.29	....	
Incand. ltg. expense.....	23.48	10.70	34.18	....	
Globes and nets.....	....	47.21	47.21	....	
Miscellaneous supplies .....	....	1.40	1.40	....	
Belle Isle Park.....	106.69	19.16	125.85	....	
Total lighting	\$ 1,530.43	\$ 674.39	\$ 2,204.82	.00882		
Shop supplies	\$	\$ 6.00	\$ 6.00	.00002		
Surgeon and hospital.....	....	45.00	45.00	.00017		
Total operating	\$ 4,326.98	\$ 2,693.78	\$ 7,020.76	.02806		
June, 1900, was.....	\$ 4,728.83	\$ 3,005.06	\$ 7,733.89	.03449		
June, 1899, was.....	4,108.93	2,160.42	6,269.35	.02907		
June, 1898, was.....	5,041.76	2,082.89	7,124.65	.03615		
June, 1897, was.....	5,592.81	2,452.40	8,045.21	.04567		



1,000 H. P. TRIPLE SAMUEL F. HODGE ENGINE DIRECT CONNECTED TO 600 K. W. STANLEY ALTERNATOR.

Operating

FISCAL YEAR

FIRST SIX MONTHS.

Maintenance :	Wages.	Stores.	Total.
Buldings, track, dock, etc.....	\$ 224.54	\$1,051.58	\$1,276.12
Steam plant	593.03	883.60	1,476.63
Electric plant	229.68	296.13	525.81
Misc. tools and machinery.....	390.94	189.23	580.17
Conduits	104.32	11.53	115.85
Towers and lamp posts.....	1,110.78	730.66	1,841.44
Arc lamps	1,337.61	376.57	1,714.18
Lines and cables.....	2,423.72	987.67	3,411.39
 Total maintenance	 \$6,414.62	 \$4,526.97	 \$10,941.59
Executive :			
Salary Sec'y and City Electrician..	\$1,599.96	\$	\$1,599.96
Printing and stationery.....	....	661.01	661.01
Store room	488.10	2.12	490.22
Office	438.70	94.00	532.70
Superintendence and draughting...	917.50	82.80	1,000.30
 Total executive	 \$3,444.26	 \$ 839.93	 \$4,284.19
Station :			
Oils	\$	\$ 447.71	\$ 447.71
Waste .....	....	119.65	119.65
Coal .....	....	10,217.66	10,217.66
Miscellaneous supplies .....	....	572.68	572.68
Wages	10,795.67	....	10,795.67
 Total station	 \$10,795.67	 \$11,357.70	 \$22,153.37
Lighting :			
Trimming and patrolling.....	\$ 8,199.40	\$	\$ 8,199.40
Carbons .....	....	4,035.12	4,035.12
Incandescent renewals .....	....	771.31	771.31
Incandescent lighting expense....	114.24	29.49	143.73
Globes and nets.....	....	459.76	459.76
Miscellaneous supplies .....	....	136.71	136.71
Belle Isle Park.....	526.10	30.86	556.96
 Total lighting	 \$ 8,839.74	 \$ 5,463.25	 \$14,302.99
Shop supplies .....	....	38.75	38.75
Surgeon and hospital.....	25.37	148.15	173.52
 Total operating	 \$29,519.66	 \$22,374.75	 \$51,894.41
Year ending June 30, 1900.....	\$27,270.24	\$17,029.77	\$44,300.01
Year ending June 30, 1899.....	32,335.55	17,965.33	50,300.88
Year ending June 30, 1898.....	32,303.34	17,991.59	50,294.93
Year ending June 30, 1897.....	38,830.29	18,605.04	57,435.33

Disbursements.

ENDING JUNE 30, 1901.

SECOND SIX MONTHS.			TOTAL FOR TWELVE MONTHS.		
Wages.	Stores.	Total.	Wages.	Stores.	Total.
\$ 328.38	\$ 113.20	\$ 441.58	\$ 552.92	\$ 1,164.78	\$ 1,717.70
472.04	604.51	1,076.55	1,065.07	1,488.11	2,553.18
365.55	525.17	890.72	595.23	821.30	1,416.53
290.82	104.63	395.45	681.76	293.86	975.62
226.00	57.50	283.50	330.32	69.03	399.35
224.62	53.41	278.03	1,335.40	784.07	2,119.47
1,060.83	335.83	1,396.66	2,398.44	712.40	3,110.84
1,905.81	533.85	2,439.66	4,329.53	1,521.52	5,851.05
 \$ 4,874.05	 \$ 2,328.10	 \$ 7,202.15	 \$11,288.67	 \$ 6,855.07	 \$18,143.74
\$ 1,628.93	\$ 10.00	\$ 1,638.93	\$ 3,228.89	\$ 10.00	\$ 3,238.89
.....	193.96	193.96	.....	854.97	854.97
425.62	3.25	428.87	913.72	5.37	919.09
396.40	94.68	491.08	835.10	188.68	1,023.78
930.00	7.95	937.95	1,847.50	90.75	1,938.25
 \$ 3,380.95	 \$ 309.84	 \$ 3,690.79	 \$ 6,825.21	 \$ 1,149.77	 \$ 7,974.98
\$	\$ 424.89	\$ 424.89	\$	\$ 872.60	\$ 872.60
.....	124.72	124.72	.....	244.37	244.37
.....	10,486.78	10,486.78	.....	20,704.44	20,704.44
.....	439.11	439.11	.....	1,011.79	1,011.79
10,626.31	.....	10,626.31	21,421.98	.....	21,421.98
 \$10,626.31	 \$11,475.50	 \$22,101.81	 \$21,421.98	 \$22,833.20	 \$44,255.18
\$ 8,544.12	\$ 26.75	\$ 8,570.87	\$16,743.52	\$ 26.75	\$16,770.27
.....	3,798.40	3,798.40	.....	7,833.52	7,833.52
.....	595.03	595.03	.....	1,366.34	1,366.34
139.20	42.00	181.20	253.44	71.49	324.93
.....	233.66	233.66	.....	693.42	693.42
.....	37.14	37.14	.....	173.85	173.85
606.52	68.01	674.53	1,132.62	98.87	1,231.49
 \$ 9,289.84	 \$ 4,800.99	 \$14,090.83	 \$18,129.58	 \$10,264.24	 \$28,393.82
.....	69.63	69.63	.....	108.38	108.38
25.00	20.00	45.00	50.37	168.15	218.52
 \$28,196.15	 \$19,004.06	 \$47,200.21	 \$57,715.81	 \$41,378.81	 \$99,094.62
\$27,626.90	\$18,160.82	\$45,787.72	\$54,897.14	\$35,190.59	\$90,087.73
29,958.75	16,405.40	46,364.15	62,294.30	34,370.73	96,665.03
31,705.88	17,991.59	49,418.25	64,009.33	35,703.85	99,713.18
35,920.53	16,785.52	52,706.05	74,750.82	35,390.56	110,141.38

Comparison of Wages Paid in Operating Expenses.

For years ending June 30.

Account.

	1901.	1900.	1899.
Maintenance:			
Buildings, track, wharf, etc.....	\$ 552.92	\$ 487.10	\$ 783.47
Steam plant	1,065.07	1,577.95	1,212.72
Electric plant	595.23	549.45	1,117.89
Miscel. tools, machinery, etc...	681.76	780.18	663.03
Conduits	330.32	584.68	463.71
Towers and lamp posts.....	1,335.40	1,047.36	893.57
Arc lamps	2,398.44	1,659.00	3,508.99
Lines and cables.....	4,329.53	3,388.93	3,512.62
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Total maintenance	\$11,288.67	\$10,074.65	\$12,156.00
Executive:			
Salary Sec'y and City Electrn...\$	3,228.89	\$ 3,666.58	\$ 3,799.92
Printing and stationery.....	.....	.....	.....
Store room	913.72	963.16	847.81
Clerks and office expense.....	835.10	1,492.17	1,562.45
Civil engineer and draughting..	1,847.50	1,184.76	1,179.92
	<hr/>	<hr/>	<hr/>
Total executive	\$ 6,825.21	\$ 7,306.67	\$ 7,390.10
Station:			
Oils	\$	\$	\$
Waste .....	.....	.....	.....
Coal .....	.....	.....	.....
Miscellaneous supplies .....	.....	.....	.....
Wages	21,421.98	20,968.70	21,469.63
	<hr/>	<hr/>	<hr/>
Total station	\$21,421.98	\$20,968.70	\$21,469.63
Lighting:			
Trimming and patrolling.....\$	16,743.52	\$15,243.86	\$19,763.17
Carbons .....	.....	.....	.....
Incand. lamp renewals.....	.....	.....	.....
Incand. lighting expense.....	253.44	252.99	296.92
Globes and nets.....	.....	.....	.....
Miscellaneous .....	.....	19.82	27.87
Belle Isle Park.....	1,132.62	880.70	1,128.61
	<hr/>	<hr/>	<hr/>
Total lighting	\$18,129.58	\$16,397.37	\$21,216.57
Shop expense	\$	\$	\$
Injuries and damages.....	50.37	149.75	62.00
	<hr/>	<hr/>	<hr/>
Total wages paid.....	\$57,715.81	\$54,897.14	\$62,294.36

Comparison of Operating Expenditures for Stores.

For years ending June 30.

Account.

	1901.	1900.	1899.
Maintenance:			
Buildings, track, wharf, etc....	\$ 1,164.78	\$ 222.78	\$ 356.28
Steam plant	1,488.11	1,034.70	1,434.15
Electric plant	821.30	329.92	239.13
Miscl. tools and machinery.....	293.86	207.58	377.32
Conduits	69.03	51.01	55.77
Towers and lamp posts.....	784.07	557.31	52.54
Arc lamps	712.40	722.49	1,201.64
Lines and cables.....	1,521.52	1,260.68	1,540.76
	<hr/>	<hr/>	<hr/>
Total maintenance	\$ 6,855.07	\$ 4,386.47	\$ 5,257.59
Executive:			
Salary Sec'y and City Electr..	\$ 10.00	\$	\$
Printing and stationery.....	854.97	551.84	517.16
Store room	5.37	6.13	37.70
Clerks and office expense.....	188.68	341.71	193.68
Civil engr. and draughting.....	90.75	117.56	33.49
	<hr/>	<hr/>	<hr/>
Total executive	\$ 1,149.77	\$ 1,017.24	\$ 782.03
Station:			
Oils	\$ 872.60	\$ 1,024.97	\$ 994.99
Waste	244.37	246.21	235.05
Coal	20,704.44	16,127.59	17,873.34
Miscellaneous supplies	1,011.79	1,037.61	678.97
Wages .....	.....	.....	.....
	<hr/>	<hr/>	<hr/>
Total station	\$22,833.20	\$18,436.38	\$19,782.35
Lighting:			
Trimming and patrolling.....	\$ 26.75	\$ 191.26	\$ 76.29
Carbons	7,833.52	8,017.60	6,295.98
Incand. lamp renewals.....	1,366.34	1,352.95	912.80
Incand. lighting expense.....	71.49	176.31	47.98
Globes and nets.....	693.42	788.91	517.02
Miscellaneous supplies	173.85	248.16	185.25
Belle Isle Park.....	98.87	140.29	93.17
	<hr/>	<hr/>	<hr/>
Total lighting	\$10,264.24	\$10,915.48	\$ 8,128.49
Shop expense	\$ 108.38	\$ 136.17	\$ 122.17
Injuries and damages.....	168.15	298.85	298.10
	<hr/>	<hr/>	<hr/>
Total supplies	\$41,378.81	\$35,190.59	\$34,370.73

Comparison of Total Operating Expenses.

For years ending June 30.

Account.

	1901.	1900.	1899.
Maintenance:			
Buildings, track, wharf.....	\$ 1,717.70	\$ 709.88	\$ 1,139.75
Steam plant	2,553.18	2,612.65	2,646.87
Electric plant	1,416.53	879.37	1,357.02
Miscl. tools and machinery.....	975.62	987.76	1,040.35
Conduits	399.35	635.69	519.48
Towers and lamp posts.....	2,119.47	1,604.67	946.11
Arc lamps	3,110.84	2,381.49	4,710.63
Lines and cables.....	5,851.05	4,649.61	5,053.38
Total maintenance	<u>\$ 18,143.74</u>	<u>\$14,461.12</u>	<u>\$17,413.59</u>
Executive:			
Salary Sec'y and City Electr....	\$ 3,238.89	\$ 3,666.58	\$ 3,799.92
Printing and stationery.....	854.97	551.84	517.16
Store room	919.09	969.29	885.51
Clerks and office expense.....	1,023.78	1,833.88	1,756.13
Civil engr. and draughting.....	1,938.25	1,302.32	1,213.41
Total executive	<u>\$ 7,974.98</u>	<u>\$ 8,323.91</u>	<u>\$ 8,172.13</u>
Station:			
Oils	\$ 872.60	\$ 1,024.97	\$ 994.99
Waste	244.37	246.21	235.05
Coal	20,704.44	16,127.59	17,873.34
Miscellaneous supplies	1,011.79	1,037.61	678.97
Wages	21,421.98	20,968.70	21,469.63
Total station	<u>\$44,255.18</u>	<u>\$39,405.08</u>	<u>\$41,251.98</u>
Lighting:			
Trimming and patrolling.....	\$16,770.27	\$15,435.12	\$19,839.46
Carbons	7,833.52	8,017.60	6,295.98
Incand. lamp renewals.....	1,366.34	1,352.95	912.86
Incand. lighting expense.....	324.93	429.30	344.90
Globes and nets.....	693.42	788.91	517.02
Miscellaneous supplies	173.85	267.98	213.12
Belle Isle Park.....	1,231.49	1,020.99	1,221.78
Total lighting	<u>\$28,393.82</u>	<u>\$27,312.85</u>	<u>\$29,345.06</u>
Shop expense	\$ 108.38	\$ 136.17	\$ 122.17
Injuries and damages.....	218.52	448.60	360.10
Total operating expense.....	<u>\$99,094.62</u>	<u>\$90,087.73</u>	<u>\$96,665.03</u>

Financial Statement.

April 4, 1893, to June 30, 1901.
Covering Existence of the Commission.

Appropriations and Receipts—**From City of Detroit:**

Balance of lighting fund of 1893.....	\$ 8,226.20
From contingent fund, 1893.....	25,000.00
From bond issue, 1893.....	600,000.00
From bond issue, 1896.....	50,000.00
From taxes levied prior to 1893.....	4,379.89
From taxes levied 1893.....	175,000.00
From taxes levied 1894.....	174,362.44
From taxes levied 1895.....	158,278.27
From taxes levied 1896.....	150,000.00
From taxes levied 1897.....	204,780.00
From taxes levied 1898.....	79,000.00
From taxes levied 1899.....	136,945.00
From taxes levied 1900.....	96,000.00
Total from City of Detroit.....	\$1,861,971.89

From other sources:

From Inspection Department.....	\$ 13,180.50
From work and material supplied other city departments	14,132.49
From sale of old material.....	5,533.86
From rent conduits, poles, etc.....	5,769.64
From lighting public buildings.....	16,089.33
From accounts payable.....	3,899.11
From conscience fund.....	35.00
Total from other sources.....	\$ 58,639.93
Grand total appropriations and receipts....	\$1,920,611.82

Disbursements—**Investment accounts:**

Real estate	\$ 63,125.00
Conduits	92,383.43
Cables	55,370.15
Buildings and wharf.....	110,204.96
Lines and poles.....	144,633.07
Towers and lamp posts.....	97,755.04
Arc plant	60,949.12
Incandescent plant	13,631.84
Steam plant	112,630.92
Railway track and scales.....	10,982.31
Machine shop	8,014.16
Arc lamps and switches.....	55,678.62
Belle Isle	26,296.21
Total amount expended for investment.....	\$ 851,654.83

Financial Statement—Continued.

Disbursements continued.

Amount brought forward.....	\$ 851,654.83
Operating expenses:	
City lighting expense from April 4, 1893, to June 30, 1896:	
Office expense	\$ 17,853.51
Advertising	319.16
Public lighting from private companies....	381,459.72
Fuel	17,162.20
Carbons	8,741.79
Pay rolls	56,178.13
Printing and stationery.....	403.12
General supplies	4,366.37
Oil and rags.....	1,637.85
Teaming	2,192.60
Incandescent lamps	432.42
Globes and nets.....	676.93
	————— \$ 491,423.80
Operating expense 12 months to June 30, 1897.	\$ 110,141.38
Operating expense 12 months to June 30, 1898.	99,713.18
Operating expense 12 months to June 30, 1899.	96,665.03
Operating expense 12 months to June 30, 1900.	90,087.73
Operating expense 12 months to June 30, 1901.	99,094.62
Cost of labor and material for other city de- partments	12,687.59
Inspection department	11,905.50
Increase of stores.....	4,074.03
Work on City Hall tower.....	612.38
Work done for Detroit Boat Club.....	654.08
Accounts receivable	651.48
Taxes charged back, 1893.....	\$ 1,487.28
Taxes charged back, 1894.....	2,525.59
Taxes charged back, 1895.....	3,063.44
Taxes charged back, 1896.....	3,421.58
Taxes charged back, 1897.....	12,469.86
	————— \$ 22,967.75
Total disbursements	\$1,892,333.38
Total appropriations and receipts.....	1,920,611.82
Excess of appropriations and receipts....	\$ 28,278.44
Balance June 30, 1901:	
City Treasurer	\$ 27,279.61
Secretary	998.83
	————— \$ 28,278.44

Receipts and Disbursements

Twelve months to June 30th, 1901.

Receipts—

From taxes year of 1900 (entire appropriation)	\$ 96,000.00
From incandescent lighting for other depts.....	2,120.08
From sale of old material.....	446.61
From rental of poles, conduits, etc.....	1,544.30
From inspection department	2,901.05
From work done other departments.....	2,166.11
From decrease in stores on hand.....	1,455.00
 Total receipts	 <hr/>
	\$ 106,633.15

Disbursements:

For 12 months operating expense.....	\$ 99,094.62
For 12 months construction expense.....	23,566.83
For 12 months inspection department expense..	2,266.64
For 12 months foreign work.....	1,420.53
For decrease in accounts payable.....	8,562.48
 Total disbursements	 <hr/>
	\$ 134,911.10
 Excess disbursements	 <hr/>
	\$ 28,277.95

Cash balances June 30th, 1900, were:

City Treasurer	\$ 54,774.76
Secretary	1,781.63
	<hr/>
	\$ 56,556.39

Cash balances June 30, 1901, should amount to.. \$ 28,278.44
 Cash balances June 30, 1901, are:

City Treasurer	\$ 27,279.61
Secretary	998.83
	<hr/>
	\$ 28,278.44

Trial Balance.

June 30, 1901.

Detroit Boat Club.....	\$ 654.08
Commercial National Bank.....	651.48
Will F. Conant.....	\$ 110.27
Petty cash	998.83
Appropriation balance July 1, 1901.....	146,825.26
City Treasurer, cash.....	27,279.61
Incandescent lighting	2,120.08
Sale of old material.....	446.61
Rentals	1,544.30
Pay rolls	62,777.06
Inspection department disbursements.....	62,777.66
Inspection department receipts.....	2,266.64
	2,901.05

Investment accounts:

Conduits	\$ 1,658.26
Belle Isle	113.41
Buildings, tracks and dock.....	200.46
Lines	3,297.80
Cables	17,073.68
Towers and lamp posts.....	218.50
Steam plant	781.05
Electric plant, Arc.....	58.39
Electric plant, Incandescent.....	149.68
Arc lamps	15.60
	23,566.83

Operating accounts:

Maintenance:

Conduits	\$ 399.35
Buildings, track, dock., etc.....	1,717.70
Steam plant	2,553.18
Electric plant	1,416.53
Miscellaneous tools and machinery.	975.62
Towers and lamp posts.....	2,119.47
Arc lamps	3,110.84
Lines and cables.....	5,851.05
	18,143.74

Executive:

Salary Sec'y and City Electrician...	\$ 3,238.89
Printing and stationery.....	854.97
Store room	919.09
Office	1,023.78
Engineering and superintendence..	1,938.25
	7,974.98

Amounts carried forward.....\$144,313.85 \$216,726.15

Trial Balance—June 30, 1901—Continued.

Amounts carried forward.....	\$144,313.85	\$216,726.15
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Station:

Oils	\$ 872.60
Waste	244.37
Coal	20,704.44
Miscellaneous supplies	1,011.79
Wages	21,421.98
	———— 44,255.18

Lighting:

Trimming arcs and patrolling.....	\$16,770.27
Carbons	7,833.52
Incandescent renewals	1,366.34
Incandescent lighting expense....	324.93
Globes and nets.....	693.42
Miscellaneous	173.85
Belle Isle Park.....	1,231.49
	———— 28,393.82
Shop supplies	108.38
Surgeon and hospital.....	218.52
Foreign work, disbursements.....	1,420.53
Foreign work, receipts.....	2,269.24

Supplies in stock:

Carbons	\$ 3,431.82
Coal	53.93
Incandescent lamps	307.13
Oils	22.23
Waste	28.07
Globes and nets.....	223.47
Trans. ropes .....	.....
Dynamo brushes	7.38
	———— 4,074.03
Accounts payable	3,788.84
	————
	\$222,784.31 \$222,784.31

Balance Sheet.

Books closed June 30, 1901.

Detroit Boat Club.....	\$ 654.08
Commercial National Bank.....	651.48
Petty cash balance.....	998.83
Appropriation balance	\$28,910.21
Cash balance, City Treasurer.....	27,279.61
Will F. Conant.....	110.27
Foreign work balance.....	848.71

Supplies in stock:

Waste	\$ 28.07
Carbons	3,431.82
Coal	53.93
Incandescent lamps	307.13
Oils	22.23
Globes and nets.....	223.47
Dynamo brushes	7.38
Accounts payable	4,074.03 3,788.84
	<hr/>
	\$33,658.03 \$33,658.03

Assets and Liabilities.

June 30, 1901.

Assets—

City Treasurer's cash balance.....	\$27,279.61
Secretary's cash balance.....	998.83
Accounts receivable	4,697.06
Stores on hand.....	4,074.03
	<hr/>
Total assets	\$37,049.53

Liabilities—

Accounts payable	\$ 3,788.84
Excess of assets.....	\$33,260.69

Office of the Public Lighting Commission.

Detroit, August 20, 1901.

Hon. David W. Simons,
 President Public Lighting Commission,
 Detroit, Mich.

Dear Sir:—

This is to certify that the disbursement vouchers of the Commission for the fiscal year ending June 30, 1901, have been examined by the Auditing Committee and approved.

JAMES E. DAVIS,
 E. H. McCURDY,
 Auditing Committee.

Office of the City Treasurer.

Detroit, July 19, 1901.

Hon. David W. Simons,
 President Public Lighting Commission,
 Detroit, Mich.

Dear Sir:—

The books of this office show that for the fiscal year ending June 30, 1901, the receipts and disbursements for the account of the Public Lighting Commission have been as follows:

Balance July 1, 1900.....	\$ 54,774.76
Receipts from sundry sources.....	111,618.08

Total	\$ 166,392.84
Total vouchers paid.....	139,113.23

Balance June 30, 1901.....	\$ 27,279.61
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Yours respectfully,
 WM. B. THOMPSON.
 City Treasurer.

Office of the Public Lighting Commission.

STATE OF MICHIGAN, } ss.
 County of Wayne,

Frank T. Bowler, Secretary of the Public Lighting Commission, being duly sworn, says that the accounts of the Public Lighting Commission have been examined and verified by him from April 4, 1893, to June 30, 1901, and that the statements published herewith are drawn correctly from the books of the Commission.

(Signed) FRANK T. BOWLER.

Subscribed and sworn to before me
 this 20th day of August, 1901.

W. J. NAGEL,
 Notary Public, Wayne Co., Mich.

Detroit, June 30, 1901.

Hon. David W. Simons,
President Public Lighting Commission,
Detroit, Mich.

Dear Sir:—

I have examined the books of the Commission for the fiscal year ending this date, and find them as follows:

Receipts—

From taxes year of 1900 (entire appropriation)	\$96,000.00
From incandescent lighting for other departments	2,120.08
From sale of old material.	446.61
From rental of poles, conduits, etc.	1,544.30
From inspection department	2,901.05
From work done other departments.	2,166.11
From decrease in stores on hand.	1,455.00
 Total receipts	 \$106,633.15

Disbursements—

For 12 months' operating expense.	\$99,094.62
For 12 months' construction expense.	23,566.83
For 12 months' inspection department expense.	2,266.64
For 12 months' foreign work expense.	1,420.53
For decrease in accounts payable.	8,562.48
 Total disbursements	 \$134,911.10
 Excess disbursements	 \$ 28,277.95

Cash balances June 30, 1900, were:

City Treasurer	\$54,774.76
Secretary	1,781.63
	<hr/>
	\$ 56,556.39

Cash balance June 30, 1901, should amount to **\$ 28,278.44**
Cash balances June 30, 1901, are:

City Treasurer	\$27,279.61
Secretary	998.83
	<hr/>
	\$ 28,278.44

I have the honor to be,

Yours very truly,

FRANCIS J. DUCAT,
City Accountant.

Office of the Public Lighting Commission,
Detroit, February 5, 1901,

To the Honorable,
The Controller,
City of Detroit.

Dear Sir:—

Complying with your request, we respectfully submit the following estimate of what funds will be required for the fiscal year ending June 30, 1902.

Operation of the Present Plant:

10,000 tons of coal, at \$2.50 per ton.....	\$ 25,000.00
Removing ashes	300.00
Oils, waste, etc.....	1,600.00
700,000 pairs carbons, at \$12 per thousand pairs.....	8,400.00
Incandescent lamp renewals.....	1,500.00
Maintenance of buildings, track, dock, etc.....	250.00
Maintenance of steam plant.....	1,500.00
Maintenance of electric plant.....	600.00
Maintenance of arc lamps.....	500.00
Maintenance of outside wiring, lines and cables.....	500.00
Maintenance of conduits and towers.....	200.00
Miscellaneous incandescent lighting expense.....	200.00
Repairs to buildings, painting stack, rebuilding ashpit, re-pairs to track and scales.....	1,000.00
Repairs to boilers and engines.....	1,500.00
Repairs to electric plant, dynamos and wiring.....	1,000.00
Repairs to arc lamps, changing and cleaning.....	1,000.00
Rebuilding lines	2,500.00
Rebuilding conduits and towers.....	2,000.00
Wages	55,000.00

Total operation, maintenance and repairs.....\$104,550.00

Betterment and Extension of the Present System:

Underground—

To place on the underground system 18 lamps now wired overhead, including new laterals, cables and lamp posts.. \$ 2,840.00

Extensions to the lighting system—

407 arc lamp extensions in most important locations..... 22,271.00

Cost of operating 407 lamps nine months at rate of \$42.70 per annum

..... 13,034.16

100 additional arc lamps..... 5,400.00

Operating same nine months..... 3,202.50

Conduits and cables, required in half mile circle from Beau-bien street conduit, Randolph street to Cadillac square, to Bates street, also on Washington avenue, between State and Park; also on Randolph from Larned to Wood-bridge, 29,790 duct feet and 13 manholes at 32 cents; and 102,455 feet of cable at 16 cents..... 25,925.60

Belle Isle Park—	
6,000 feet conduit.....	1,500.00
20,000 feet cable.....	3,200.00
Addition to the transformer house.....	700.00
Incandescent lines to new buildings.....	500.00
14 iron lamp posts at \$50.....	700.00
Palmer Park extension—	
Feeder only	800.00
Extension incandescent system—	
Running feeder to 7 schools, 7 fire engine houses and 2 police stations in west end of city.....	5,628.00
Operating 1,382 lights in above 16 buildings.....	1,000.00
Station betterment—	
Net cost of changing one triple engine set and four arc dynamos to alternator direct connected to same engine to operate both incandescent and arc lighting service.....	10,000.00
Total	\$ 96,701.26
Total estimate	\$201,251.26

We have the honor to be,

Yours respectfully,

D. W. SIMONS,
E. H. McCURDY,
JAMES E. DAVIS.
FREDERICK F. INGRAM,
JOHN ERHARD,
HAMILTON CARHARTT,
Commissioners.

Office of the City Controller,
Detroit, June 29, 1901.

To the Honorable,
The Public Lighting Commission.

Gentlemen:—

The Board of Estimates of the City of Detroit, after considering the estimates submitted by the Public Lighting Commission for the operation and maintenance of the present plant for the fiscal year ending June 30, 1902, and for the improvements and extensions of the public lighting system, granted the following:

For operation and maintenance of the present plant.....	\$ 98,000.00
Arc and incandescent lighting extension.....	45,328.00
Station betterment	10,000.00
Total appropriation	\$153,328.00

Respectfully yours,
F. A. BLADES,
City Controller.

APPENDIX.

Public Lighting Act.

AN ACT to amend an act, entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, by adding a new chapter thereto.

Section 1. The People of the State of Michigan enact, That an act entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, be and the same is hereby amended by adding a new chapter thereto to be known as chapter thirteen, to read as follows:

CHAPTER XIII.

Section 1. There shall be a board of commissioners in said city known as the public lighting commission. Said commission shall consist of six members, who shall be appointed by the mayor and approved by the common council. The first appointment of members of this commission shall be made at the next meeting of the common council after this chapter shall have become operative, and the first appointments shall be made for the terms respectively of one, two, three, four, five and six years, and the members so appointed shall hold office until their successors are appointed and shall have qualified. Their successors shall be appointed at the termination of said respective terms for the term of six years. Said commissioners shall take and file in the office of the city clerk the oath of office prescribed for city officers, and shall then enter upon the performance of their duties. They shall appoint their president and secretary, who shall perform the duties usually appertaining to such offices and such as shall be prescribed by said board. The president of said board shall be ex-officio a member of the board of estimates. Said board of commissioners shall have authority to call upon the city surveyor for any services they may require in making maps or diagrams of locations of lights and wires within the city limits, and the city clerk and board of public works shall furnish them such information as they may require for the proper discharge of their duties.

Sec. 2. The said city may contract for the lighting of public buildings, streets, avenues, parks, public grounds and places for any period not exceeding three years. It shall have power to procure lands, and purchase or construct the necessary buildings, engines, dynamos, and other machinery, tools, lamps, lines, conduits, poles, towers and other apparatus and appliances constituting a plant for lighting the said city by electricity or by any other means or system, and if the common council deem it desirable it may purchase towers, poles, wires, lamps and other appliances, and cause lines of wire to be constructed, the use of which it may let to any persons or corporation contracting to light said city. It shall also have power to lay pipes and conduits in the highways, alleys and public places, for gas or electric light wires, and to erect in the highways, alleys and public places, poles, towers, or posts for wires or lamps and to place, construct and maintain the necessary lines of wires, either below or above ground, in the highways, alleys or public places: Provided, That nothing in this act shall be construed as granting said municipality or said board the right to engage in the business of private or commercial lighting.

Sec. 3. If the common council shall determine to contract for lighting, it shall by resolution direct the public lighting commissioners to enter into a contract for lighting said city, either by electricity or by such other means as it may determine, for a period of time to be mentioned in such resolution. It shall thereupon be the duty of said commissioners to prepare specifications and advertise for proposals for a period of not less than five days, and enter into a contract in behalf of said city with the lowest responsible bidder, for lighting said city by such means as are specified in such resolution: Provided, It shall be competent for the commissioners to contract for lighting the public buildings and any part or portion of the city by different means or systems.

Sec. 4. If the common council shall determine that it is advisable to establish a plant for public lighting, to be owned by the city, it may direct said commissioners to purchase the necessary lands, machinery, wires, poles, lamps, towers and other

apparatus and appliances mentioned in the second section of this chapter the cost of which shall not exceed eight hundred thousand dollars. And it shall thereupon be the duties of said commissioners without further approval or confirmation of their contracts by the common council, to carry into effect the authority thereby conferred, and to make the necessary purchase of lands, machinery, engines, tools, lamps, apparatus and appliances, and construct the buildings required and cause to be constructed or laid all necessary conduits and lines of wire below ground, and to erect and construct all necessary poles, towers, posts, lines of wire above ground, which they shall deem necessary or required according to such system or systems as they may deem best for the lighting of said city. (As amended January 17, 1895.)

Sec. 5. The said commissioners may employ an electrical engineer, who shall be known as the city electrician, and such other superintendents, engineers, clerks, agents and subordinates under them as may be necessary to carry into effect the provisions of this chapter, regulate and define their duties and prescribe their compensation.

Before the common council shall direct said commissioners to establish a plant as herein provided, it shall by resolution submit to the electors of said city, to be voted upon by said electors, the question as to whether the authority hereby conferred shall be exercised. The proposition shall be stated upon the ballots to be printed by the election commissioners, in the following form: "For a city lighting plant—Yes," and the same words repeated followed by the word "No;" and any elector may vote for or against said proposition by marking a cross opposite said words "Yes" or "No," respectively. The votes upon said proposition and for and against the same, respectively, shall be certified, returned and canvassed by the board of city canvassers in the manner now provided by law for certifying, returning and canvassing votes cast for city officers. And if a majority of the electors voting thereon in said city shall vote in favor of said proposition then the authority hereby conferred may be exercised; otherwise the same shall not be so exercised. Notice shall be given by the city clerk by publication in four or more newspapers of the election to vote upon said proposition at least five days before the election.

Sec. 6. The said commissioners shall have a general supervision and management of all public lighting, and of any plant established by the city, as herein provided for that purpose, and all employees engaged in or about the construction or operation thereof, and shall make the necessary purchase of fuel, tools, supplies, materials, apparatus and appliances required in the operation and management of said plant, without further approval or confirmation of their contracts by the common council: Provided, That the expenditures for the operation and management of said plant shall not exceed in any one year the tax levied for that purpose: And provided further, That after the adoption by them of plans and specifications for the erection of any buildings, the board of public works shall have the immediate supervision or superintendence of construction thereof, and also of the laying of conduits in the public streets, and of the necessary excavation, refilling and repaving caused thereby. (As amended January 17, 1895.)

Sec. 7. The said city may raise by tax the necessary funds to provide for the public lighting and for the purpose of providing for the construction of the public lighting plant, as herein provided, may raise moneys by tax or issue the bonds of said city, payable at such times and in such amount and at such rates of interest as the common council may determine, subject, however, to the approval of the board of estimates as provided by section 4, chapter 8, of act number 488 of the public acts of 1887. It shall also have power to issue bonds in like manner or raise moneys by tax for the purchase or construction of conduits, wires, posts, poles, towers and lamps, for use by any party or parties contracting for the public lighting as herein provided.

Sec. 8. No contract shall be let nor any purchase be made of any lands or property requiring the payment of any money, nor shall any moneys be paid for public lighting in excess of the tax levied for that purpose or of moneys raised by issuing bonds as herein provided.

Sec. 9. The public lighting commissioners shall have the supervision of the construction of all the electric lighting lines of wires in said city whether owned by the city or by other parties, and of all connections made with any building or buildings, and no such wires or lines of wire shall be placed, laid, erected or constructed, nor shall any pole or post or conduit be laid, placed or constructed for such lines, nor any connection made with any building or buildings, except under such general regulations as they from time to time may adopt. They may prescribe the limits of the

district or districts in said city, within which it shall not be lawful to erect poles and train wires for such lines above ground in any street or highway, and they may prescribe or determine the other street or streets in which it may be lawful to erect or construct such lines of wire above ground. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor and shall be punished accordingly.

Sec. 10. The common council shall have power to adopt ordinances not in conflict herewith, to carry out the provisions of this chapter and to regulate the use of electricity for lighting purposes in said city, and the training or using of wires therefor, and to regulate or prohibit the erection of poles in the streets of said city for such wires, or the training thereof.

Sec. 11. Any person who shall cut, break, injure or destroy any building, engine, dynamo or other machinery, or appliances, poles, posts, towers, lamps, wires, or conduits erected, constructed or used for the public lighting of said city, whether owned by the corporation or by any party or parties contracting for the lighting of said city, with intent to prevent or interrupt the lighting of any public building, or any part or portion of said city, shall be deemed guilty of a misdemeanor, and shall be punished therefor by a fine of not less than twenty-five dollars nor more than one thousand dollars, or by imprisonment not exceeding two years, or by both fine and imprisonment in the discretion of the court, and proof that the acts was willful shall be prima facie evidence of such intent.

This act is ordered to take immediate effect.

Approved March 18th, 1893.

General Lighting Ordinance.

A GENERAL ORDINANCE authorizing the granting of permission to construct, maintain and operate poles, conduits, wires or other conductors for the purpose of furnishing electric lighting in the City of Detroit.

It is hereby ordained by the People of the City of Detroit:

Section 1. That any person or corporation carrying on a manufacturing business in the City of Detroit, and having surplus power applicable to the purpose, may apply to and receive a permit from the Public Lighting Commission to lay conduits, erect poles and place thereon or therein wires or other conductors for the purpose of furnishing electric lighting to any person or persons desiring the same, and within the district to be designated in the application to be made for such permit. Said Public Lighting Commission is hereby authorized to grant such permits for the laying of conduits, erection of poles, placing of wires or conductors thereon in the streets, alleys or other highways of the city; subject, however, to the conditions and restrictions imposed by this ordinance, and all other general ordinances now in force or which may hereafter be adopted concerning the same.

Sec. 2. The person or corporation to whom such permit shall be granted shall do no injury to any street, avenue, alley, lane, park or public square, or to any shade trees, or in any manner disturb or interfere with any water or gas pipes, or with any public or private sewer now or hereafter laid or constructed by any authorized person, persons or corporations, or the wires and conduits of any telephone, telegraph or electric lighting or street railway company, or of the police, fire or lighting commission, and shall fully indemnify and save harmless the City of Detroit from any and all claims or damages for which said city might be made or become liable to pay by reason of the construction, maintaining, repairing or operating of said poles, conduits, wires, lamps or other conductors, or any apparatus connected therewith or otherwise arising from the use or possession of the rights and privilege granted, or from any neglect on the part of said corporation or person or its or his employees to comply with any of the ordinances of the City of Detroit, and especially shall indemnify the city against and assume all liability and damages which may arise, come or occur to the City of Detroit from any injury to persons or property from the doing of any work herein mentioned, or the neglect of any person or company or its em-

ployes to comply with any ordinance relative to the use of streets, or other public places, especially as to the putting up of lights or barriers at or around excavations, and the acceptance by the person, persons or corporation of such permit of this ordinance shall be an agreement by it to pay to the City of Detroit any sum of money for which the city may become liable from or by reason of such injury.

Sec. 3. All poles erected under such permit shall be firmly set in the ground next to and within the curbstone, so as to cause the least obstruction, in such manner and of such uniform height, size, color and material as shall be approved or designated by the Public Lighting Commission and the Board of Public Works.

Sec. 4. All operating and conducting mains and wires of any such person, persons or corporation shall be thoroughly and securely insulated with a material of sufficient thickness and durability to protect them from abrasion and other mechanical injury, and impervious to water, to be approved by the Public Lighting Commission, and when laid beneath the surface of the ground, all conduits shall be laid in streets and avenues in a line parallel with the curb line thereof, at such distance from the curbstone, or where the curbstone should be as shall be designated by the Board of Public Works, and to a depth not exceeding two feet. It is especially required that all service wire used by such person, persons or corporation shall be connected only with a main laid in a conduit in the alley or at the side of the street nearest to the building into which it is desired to conduct such service wires.

Sec. 5. At least twenty-four hours before opening or excavating in any street, alley or any public space for the above or for any other purpose, said person, persons or corporation shall notify the Board of Public Works in writing of such desire, stating the place where and the object for which said opening is to be made, and obtain the permit of said board, and in the opening and refilling of all openings and excavations made as aforesaid, the relaying of the pavements and other works necessary to the complete restoration of the streets, pavements, sidewalks or ground to equally good condition as when disturbed, the said person, persons or company or its servants or employees shall be under the supervision of the Board of Public Works or its authorized agents, and shall promptly comply with any order or resolution of said board or its agents, or of the Common Council, in reference thereto. Nor shall any street, avenue or public space be allowed to remain open or incumbered for a longer period than shall be necessary to execute the work for which the same has been opened. And the Board of Public Works or the Common Council may determine the question of such necessity.

The earth removed in making such excavation shall be restored and the pavement be relaid by said person or corporation in as good a condition as before the making of such excavation, and thereafter be maintained in as good condition as the surrounding pavement until the street or alley in each case is repaved. No excavation in any street, alley or public place shall be allowed to remain open or said street, alley or public place be encumbered for a longer period than shall be necessary to execute the work for which the same is made.

The cost of restoring the earth or otherwise, arising from such excavations and the laying of the pavements and repairs thereto, caused by the opening of any such street, alley or public place, shall be paid by said person or corporation, and said work shall be done under the supervision of the Board of Public Works, and the expense of such supervision shall be paid by said company, on presentation of bills, certified by said board, and any expense to which the city shall be put from neglect of said company or its employes in the doing of any work, or the doing of the same in an unworkmanlike manner, of the digging of ditches or holes and erection of poles, or restoring the earth or any excavation, or relaying or replacing of any pavement, shall be paid in like manner by said company on presentation of the bills of cost certified by said board, and it shall be the duty of said person or corporation in each instance to promptly pay all bills for labor and material, supervision, etc., incurred by the Board of Public Works in relaying and restoring any pavement or surface disturbed by said person, persons or corporation, and if said bills, properly certified by the Board of Public Works, remain unpaid for the space of thirty (30) days after the presentation to said person or corporation, it shall be the duty of the Board of Public Works to pay over to the credit of the proper fund the amount of any bills so remaining unpaid from the guaranty money deposited by said person or corporation with said board, and on refusal, neglect or failure by said person, persons or corporation to make such guaranty money good to its full extent as herein first named prior to the next meeting of the Common Council, the Board of Public Works shall report the facts in the case to the Common Council for such action by the latter body as is permitted or deemed proper under the terms of the ordinance.

Sec. 6. The Public Lighting Commission shall have the supervision of the construction of all electric light lines of wires erected in pursuance of the authority hereby granted, and all connections made in any public building or buildings, as provided by chapter 13 of the Charter of the City of Detroit. In the lines of wires or the laying of any conduits as herein provided, said Lighting Commission shall prescribe or determine the street or streets in which it shall be lawful to erect or construct lines of wires above ground, and no person shall erect any pole or train any wire for such lines above ground in any street or highway excepting the same be authorized by such permit.

Any person violating the provisions of this section shall be punished by a fine not exceeding five hundred dollars, and in the imposition of such fine the court may make a further sentence that the offender be imprisoned in the Detroit House of Correction until such fine be paid, provided the term of imprisonment shall not exceed the period of six months.

Sec. 7. Any permit hereby authorized shall not become operative and authorize the construction of any line of wires above ground or the laying of any conduits until the person or company to whom the same may be granted shall have filed with the City Controller a satisfactory bond, to be approved by the Controller, in the sum of twenty thousand dollars, conditioned that the person or corporation to whom such permit is granted will faithfully comply with and perform the terms and conditions of this ordinance; and such person or corporation shall also have deposited and shall keep on deposit with the City Treasurer the sum of two hundred dollars to cover the expense of the replacing of the earth in making the repairs to pavements required to be relaid by such person or company under the provision of this ordinance, and as a guarantee for the prompt payment of any bills for such work presented by the Board of Public Works, such deposit shall be kept good to the amount of two hundred dollars, and on failure to keep the same good to that amount such permit shall become void.

Sec. 8. In addition to all usual and ordinary taxes and general or special assessments for which any such person, persons or corporation shall be liable, he or it shall annually on the first day of July pay to the City of Detroit, as part of the consideration for the rights herein conferred, the annual sum of one dollar for each pole erected and maintained by it, and also the sum of \$5 per annum for each and every mile of wire operated and maintained by it, computation thereof to be based upon each strand of wire, whether above or below the surface of the ground, said sum to be paid to the City of Detroit for the first year or portion of a year within one month after the construction and erection of such poles, and annually thereafter on the first day of July in each and every year in advance. And the bond mentioned above in section 7 shall be further conditioned for the payment of said sums.

Sec. 9. Whenever the Public Lighting Commission shall deem it for the public interest they may require, as a condition to the issuing of any permit, that the wires shall be laid in the public conduits, and if any wires shall be strung on poles along any highway, and public conduits shall afterwards be laid therein, said commission may require the wires so strung upon poles to be taken down and put in the public conduit; and upon any refusal to do so, may remove the same. Said commission may prescribe the terms and conditions upon which the public conduits shall be used for such purpose.

Sec. 10. Any rights acquired under any such permit shall cease whenever the Common Council shall so direct, and all poles and wires shall thereupon be removed at the expense of the person or corporation erecting or controlling the same.

Sec. 11. When any wires erected under any such permit shall interfere with any wires of the Public Lighting Commission, or with any telephone or telegraph wires of the Fire Commission or of the Police Department, the Public Lighting Commission may direct the removal of the same, or such alterations in relation thereto as will obviate or prevent such interference. When any person or corporation shall have erected a pole on any portion of a street, it shall be subject to the condition that the Public Lighting Commission may authorize other persons to whom such permits may be granted, to use such pole already erected, and upon such terms and conditions as the Public Lighting Commission may direct.

Sec. 12. This ordinance shall take immediate effect.

Approved October 17, 1893.

Lighting System Ordinance.

AN ORDINANCE to protect the Public Lighting System.

It is hereby ordained by the People of the City of Detroit:

Section 1. That no person shall cut, break, injure, deface or destroy any building, engine, boiler, dynamo or other machinery or appliances, poles, lamp posts, towers, wires or conduits erected or constructed for the public lighting system of the city of Detroit.

Sec. 2. No person shall open or tamper with any manholes or handholes or any vault or junction box connected with the conduits of the public lighting system, nor shall any person, association, corporation, or company attempt to place or place any wires in said conduits, or upon the poles of said system without permission in writing from the Public Lighting Commission.

Sec. 3. No person, association, corporation or company shall post, paint, impress or in any way affix to any pole connected with the public lighting system of said city, or any box, lamp post, tower, wire or other appliance connected therewith, any placard, sign, notice or announcement of any kind, or cause or allow any kite or other obstruction to become entangled with the wires, or apparatus of said system.

Sec. 4. Any violation of any provision of this ordinance shall be punished by a fine not exceeding one hundred dollars and costs; and in the imposition of any fine the court may make a further sentence that the offender may be imprisoned in the Detroit House of Correction until the payment thereof, for any period not exceeding six months.

Sec. 5. This ordinance shall take immediate effect.

Approved September 17th, 1895.

Public Building Ordinance.

AN ORDINANCE relating to the lighting of public buildings.

It is hereby ordained by the People of the City of Detroit:

Section 1. That the City Hall, Municipal Court building, all Police Stations, Fire Engine Houses, House of Correction, all public school buildings and all other buildings occupied by any of the several boards or commissions forming part of the government of the City of Detroit be and the same are hereby declared to be public buildings.

Sec. 2. It shall be the duty of the Public Lighting Commission to furnish the electrical current required for the proper lighting of all public buildings. Any electric current supplied by the said commission may be used in said buildings for the driving of ventilating fans or other similar appliances.

Sec. 3. During the remainder of the present fiscal year the expense of furnishing such electrical current shall be paid as heretofore by the Common Council or by the several boards and commissions using the same, but the Public Lighting Commission shall include in their estimates hereafter the expense of such lighting of all public buildings or such of them as the board or commission in charge thereof shall require to be lighted.

Sec. 4. Whenever any new public building shall be constructed it shall be the duty of the board or commission in charge thereof to submit the plans therefor to the Public Lighting Commission, and the said commission shall give such instructions as it may deem proper and necessary to insure the proper and safe wiring of such buildings and to supervise the same.

Approved December 12th, 1895.

An Ordinance to Regulate Electric Wiring and the Use of Electricity.

It is hereby ordained by the People of the City of Detroit:

Section 1. The Public Lighting Commission of the City of Detroit shall assume the supervision of the putting in of all electric wiring, connections and apparatus, in or on any building in the City of Detroit, and shall establish rules and regulations to which all electrical equipments hereafter erected or used within the City of Detroit shall conform.

Sec. 2. The Public Lighting Commission may, with the consent of the Common Council, employ a sufficient number of competent electricians, not exceeding three, as inspectors, whose duty it shall be to examine each electrical equipment hereafter erected and make a detailed report of same to said Commission as to whether it is in compliance with the rules and regulations of the Commission, and a record of all such reports made by said inspectors shall be kept on file in the office of said Commission, and when an equipment is found to conform to the rules and regulations adopted, the said Commission shall issue a certificate in duplicate that the terms of this ordinance have been complied with, but no such certificate shall be granted until the equipment is made to conform to the rules prescribed herein, and it shall be unlawful to use any such electrical equipment or to furnish electrical current or currents for the same until certificate has been furnished in accordance with the terms of this ordinance, and the rules and regulations of said Commission.

Sec. 3. No person, firm or corporation, shall equip any building with wiring or apparatus, or make any alteration of, change in, or addition to any electrical wiring or apparatus, without first notifying the Public Lighting Commission in writing and giving a general description of the work to be done, so that ample opportunity for inspection may be had, and receiving a written permit to do the work described, and such equipment, alteration, change or addition shall be done to the satisfaction of the Public Lighting Commission, who shall issue a certificate in like manner as provided in section two herein.

Sec. 4. The Public Lighting Commission shall have the right and power, and it shall be their duty to cause all electrical wires and apparatus in or on any building in the City of Detroit to be inspected from time to time, in order to ascertain whether the electrical wiring or apparatus is in any respect dangerous to life or property, and if any part of said electric wires or apparatus shall be found dangerous to life or property, the Public Lighting Commission shall notify the owners of the building or equipments to cease using the electric current in such dangerous equipments; to have the defects in said equipments repaired within a reasonable time, not exceeding ten days from date of notice. The Public Lighting Commission shall also give notice to the company furnishing the electric current to any such dangerous equipment to cease to supply the same until the defects therein are repaired, and it shall be the duty of such company, immediately upon receipt of such notice, to cease to supply the electric current to any such dangerous equipment until such defects are repaired.

Sec. 5. When, upon application inspection is made of the wiring or equipment in any building in this city, the company or person installing such equipment shall, before certificate is issued, pay to the Public Lighting Commission, of this city, for such inspection, the following fees:

For 15 lights or less.....	\$.50
When more than 15 lights, and not more than 25 lights.....	.75
When more than 25 lights, and not more than 50 lights.....	1.25
When more than 50 lights, and not more than 100 lights.....	2.00
When more than 100 lights, and not more than 150 lights.....	2.50
When more than 150 lights, and not more than 250 lights.....	4.00
When more than 250 lights, and not more than 500 lights.....	5.00
For each additional light, over 500.....	1 cent each

Miniature incandescent lights, one-half above rates.

WHEN WIRING IS FOR ARC LIGHTS.

For two lights or less.....	.50
When more than two lights—each.....	.25

When wiring is done for dynamo, electric machines, whether used for motors or generators:

For one K-W, or less.....	50
When more than one K-W, and not more than three K-W.....	1 00
When more than three K-W, and not more than eight K-W.....	1 50
When more than eight K-W, and not more than fifteen K-W.....	2 00
When more than fifteen K-W, and not more than thirty K-W.....	2 50
When more than thirty K-W, and not more than 60 K-W.....	5 00
When more than sixty K-W.....	8 00

For inspection of electrical apparatus for which no fee is herein prescribed, and for the re-inspection of electrical installations, as provided in section 4, hereof, and for the inspection of temporary installations for decorative, advertising or theatrical purposes, the Public Lighting Commission may prescribe a fee of not exceeding seventy-five cents (75c) per hour, for the time actually consumed by each inspector in making the inspection, and it shall be the duty of the Public Lighting Commission to turn all money received under this ordinance into the Public Lighting fund of the City of Detroit.

When a person, firm or corporation shall be found to have intentionally or negligently violated any of the rules and regulations established by the Public Lighting Commission, under this ordinance, or when through any fault of the person, firm or corporation doing the work, it is necessary to make extra inspection of the work, the Public Lighting Commission shall have the power to charge for such extra inspection, a fee not to exceed seventy-five cents per hour for the time actually consumed by each inspector in making the inspection.

Sec. 6. Any person, firm or corporation who shall do or attempt to do electrical construction work whether original work or alterations without giving notice in writing to the Public Light Commission, and obtaining a permit to do such work, shall upon conviction thereof be fined in the sum of not less than \$20 nor more than \$100 for each offense, and any person, firm or corporation who shall violate any of the provisions of this ordinance, for which a penalty is not herein otherwise provided, and any occupant or owner of premises where electric wiring or apparatus is used or to be used, who shall refuse to allow, or shall prevent or interfere with any inspector in the discharge of his duties under this ordinance, he or they shall upon conviction for each offense, forfeit and pay a fine of not less than \$5.00 nor more than \$100, in the discretion of the court, and in the imposition of any fine or costs, the court may impose a further sentence that the offender be imprisoned in the Detroit House of Correction until the payment thereof, providing that the term of such imprisonment shall not exceed three months.

Sec. 7. This ordinance shall not be construed to relieve from or lessen the responsibility of any party owning, operating, controlling or installing any electrical equipment for damages to anyone injured by any defect therein, nor shall the city be held as assuming any such liability by reason of the inspection authorized herein or certificates issued.

Sec. 8. This ordinance shall take effect upon and after August 1, 1896.

Approved July 28, 1896.

Sections 4 and 5 of this ordinance are given as amended by the Common Council on September 10, 1901, to take immediate effect.

An Ordinance to Regulate Electric Wiring and the Use of Electricity.

It is hereby ordained by the People of the City of Detroit:

Section 1. That the Public Lighting Commission of the City of Detroit shall annually examine wiremen seeking to engage in that vocation (the term wiremen intending to and does hereby designate and refer to those who string, train or place electric wire on the inside of buildings, and not to apply to linemen, or those engaged in stringing, training or placing wire on the outside of buildings or structures), as to their ability to do such electrical work, upon written application for, and who apply in person for examination, and to such as pass said examination to the satisfac--

tion of the Public Lighting Commission, a permit in accordance therewith shall be issued by the said Lighting Commission; said permit shall be issued in the form of a badge, which said badge shall be worn in a conspicuous place on the person of such wireman or electrical worker while he is engaged in doing any manner of electric wiring or while engaged in making repairs to electrical wire or fixtures in any building or structure in said City of Detroit. And it shall be unlawful for any person to engage in doing any manner of electrical wiring or repairs to electric wire or fixtures, in any building without such badge conspicuously displayed on his person while engaged in such work. Any wireman or electrical worker (not including linemen) who fails to conform in every respect to the rules prescribed by this ordinance, or who loans or transfers his badge to another, does thereby revoke his permit, and it shall be the duty of the inspector of the Public Lighting Commission to take up and suspend said person to whom said badge has been issued and report same to the Public Lighting Commission, who shall give said person a hearing, and it shall be optional with the said commission to renew or revoke the said permit until the provisions of this ordinance are complied with.

Sec. 2. It shall be unlawful for any individual, firm or corporation to string or place any bare grounded wire, such as telegraph or telephone wires, on the same pole, stanchion or upright, with high potential wires, without separating said wires carrying high potential currents from said bare grounded wires by a distance of at least eight feet in the clear. And it shall be the duty of any individual, firm or corporation, quasi municipal or otherwise, to remove said bare wires to conform to this ordinance as herein provided, within ninety days from date of service of notice to separate said wires given by the Public Lighting Commission or its duly appointed agent. High potential wires in this ordinance being wires carrying currents of three hundred volts or over.

Sec. 3. It shall be unlawful for any individual, firm or corporation to encase, cover or introduce any wire, carrying electrical current into any iron pipe or any metallic electrical conducting material, affixed to any wooden pole, stanchion or upright, which shall extend nearer than eight feet from the lowest cross-arm on said wooden pole, stanchion or upright; and it shall be unlawful to expose any electrical wire without such insulation in any manner which shall form a connection or circuit with the earth in such manner as to be dangerous or injurious to life or health. This provision not to apply or prevent the encasement of said wires in any non-conducting substance or material such as wood, etc.

Sec. 4. It shall be the duty of any company stringing bare wires wherever said wires cross trolley wires, to provide safe and suitable insulation for all such bare wires at such crossings where in case of breakage said wires would come in contact with the aforesaid trolley wires.

Sec. 5. It shall be the duty of the Public Lighting Commission, upon complaint of any citizen, to examine or cause to be examined any dangerously exposed electrical wires, and to notify the individual, firm or corporation owning or controlling the said exposed wire of its dangerous condition, and to have the same remedied at once, and made safe, and upon the failure of such individual, firm or corporation to remedy and make safe said dangerously exposed wire, it shall be the duty of the said Public Lighting Commission to cause a complaint to be made for a breach of this ordinance and to prosecute the said individual, firm or corporation for such breach; and any refusal or neglect to remedy said dangerously exposed wire, after due and proper notice from the said Lighting Commission, shall subject the individual, firm or corporation owning or controlling the same to a fine or imprisonment.

Sec. 6. All day circuits, excepting street railway circuits, of high potential currents shall be designated by some mark or distinctive insulator upon each wire at each insulator designate the same as such.

Sec. 7. It shall be the duty of any individual, firm or corporation to remove from any building, structure or pole all dead wires, which are not actually in use, within thirty days from notice given by the Public Lighting Commission.

Any breach of this ordinance shall subject the offender to a fine of not exceeding two hundred dollars, or to imprisonment for a period of not exceeding sixty days, and each subsequent breach of this ordinance shall be deemed a separate offense, and shall be so punishable.

Sec. 8. This ordinance shall take immediate effect.

Approved November 1st, 1898.

AN ORDINANCE to regulate the use of wires for telegraph, telephone and electric lighting and all other service wires in the City of Detroit.

It is hereby ordained by the people of the City of Detroit:

Section 1. Any person or corporation may apply to and receive a permit from the Public Lighting Commission, to lay conduits, erect poles and place thereon or therein wires or other conductors for the purpose of furnishing telephone, telegraph and electric lighting or other service wires to any person or persons desiring the same, and within the district to be designated in the application to be made for such permit. Said Public Lighting Commission is hereby authorized to grant such permits for the laying of conduits, erection of poles, placing of wires therein or thereon in the streets, alleys or other public places in the city, subject, however, to the conditions and restrictions imposed by this ordinance and all other general ordinances now in force or which may hereafter be adopted concerning the same.

Sec. 2. The person or corporation, to whom such permit shall be granted, shall do no injury to any street, avenue, alley, lane, park or public square or to any shade trees, or in any manner disturb or interfere with any water or gas pipes or with any public or private sewer now or hereafter laid or constructed by any authorized person, persons or corporations or the wires and conduits of any telephone, telegraph or electric lighting or street railway company or of the Police, Fire, or Lighting Commissions, and shall fully indemnify and save harmless the city of Detroit from any and all claims or damages for which said city might be made or become liable to pay by reason of the construction, maintaining or repairing or operating of said poles, conduits, wires or other conductors, or any apparatus connected therewith or otherwise arising from the use or the possession of the rights and privileges granted or from any neglect on the part of said corporation or person or its or his employes to comply with any of the ordinances of the city of Detroit, and especially shall indemnify the city against and assume all liabilities and damages which may arise, come or occur to the city of Detroit from any injury to persons or property from the doing of any work herein mentioned, or the neglect of any person, or company, or its employes, to comply with any ordinance relative to the use of streets or other public places, especially as to the putting up of lights or barriers at or around excavations and the acceptance by the person, persons or corporations of such permit of this ordinance shall be an agreement by it to pay to the city of Detroit any sum of money for which the city may become liable from or by reason of such injury.

Sec. 3. All poles erected under such permit shall be firmly set in the ground and in streets next to and within the curbstone, so as to cause the least obstruction in such manner, and of such uniform height, size, color and material as shall be approved by the Public Lighting Commission and the Board of Public Works; the number of cross-arms, minimum distances same from the surface of the street, the proximity of different wires to each other, their arrangement, including guy wires, etc., to be approved by the Public Lighting Commission.

Sec. 4. All operating and conducting mains and wires of any such person, persons or corporation shall be thoroughly and securely insulated with a material of sufficient thickness and durability to be not easily abraded or injured mechanically, and impervious to water, where deemed necessary by the Public Lighting Commission, and to be approved by the Public Lighting Commission. All conduits shall be laid in streets and avenues in a line parallel with the curb line thereof at such distance from the curbstone, or where the curbstone should be, as shall be designated by the Board of Public Works, and to a depth to be designated by the Board of Public Works. It is especially required that all service wires used by such person, persons or corporation shall be connected only with a main laid in a conduit in the alley or at the side of the street nearest to the building into which it is desired to conduct such service wires.

Sec. 5. At least twenty-four hours before opening or excavating in any street, alley or any public space for the above or for any other purpose, said person, persons or corporation shall notify the Board of Public Works in writing of such desire, stating the place where, and the object for which such opening is to be made, and obtain the permit of said Board, and in the opening and refilling of all openings and excavations made as aforesaid, the relaying of the pavement and other work necessary to the complete restoration of the street, pavement, sidewalks or grounds to equally good condition as when disturbed, the said person, persons or corporation, or its servants,

or employes, shall be under the supervision of the Board of Public Works, or its authorized agents, and shall promptly comply with any order or resolution of said Board or its agents, or the Common Council in reference thereto, nor shall any street, avenue or public place be allowed to remain open or incumbered for a longer period than shall be necessary to execute the work for which the same has been opened, and the Board of Public Works, or the Common Council, may determine the question of such necessity.

The earth removed in making such excavation shall be restored and the pavement be relaid by such person, persons or corporation in as good a condition as before the making of such excavation, and thereafter be maintained in as good a condition as the surrounding pavement, until the street or alley in each case is repaved. No excavation in any street, or alley or public place shall be allowed to remain open, or said street, alley or public place be incumbered for a longer period than it shall be necessary to execute the work for which the same is made.

The cost of restoring the earth or other cost arising from such excavations and the relaying of the pavement, and the repairs thereto caused by the opening of any such street, alley or public place shall be at the expense of said person, persons or corporation, and said work shall be done under the supervision of the Board of Public Works, and the expense of such supervision shall be paid by said company on presentation of bills certified by said board, and any expense to which the city shall be put from the neglect of said company or its employes in the doing of any work, or the doing of the same in any unworkmanlike manner, of the digging of ditches or holes and erection of poles, or restoring the earth or any excavation, or relaying or replacing of any pavement, shall be paid in like manner by said company on presentation of the bill of costs certified by said Board of Public Works. And it shall be the duty of said person, persons or corporation in each instance to promptly pay all bills for labor and material, supervision, etc., incurred by the Board of Public Works in relaying and restoring any pavement or surface disturbed by said person, persons or corporation, and if said bills properly certified by the Board of Public Works remain unpaid for the space of thirty (30) days after the presentation to said person, persons or corporation, it shall be the duty of the Board of Public Works to pay over to the credit of the proper fund the amount of any bills so remaining unpaid from the guarantee money deposited by said person, persons or corporation with said Board, and on refusal, neglect or failure by such person, persons or corporation to make such guaranty money good to its full extent as herein first named, prior to the next meeting of the Common Council, the Board of Public Works shall report the facts in the case to the Common Council for such action by the latter body as is permitted or deemed proper under the terms of the ordinance.

Sec. 6. The Public Lighting Commission shall have the supervision of the construction of all lines of wire erected in pursuance of the authority hereby granted, and all connections made with any building or buildings. In the stringing of line of wires or the laying of any conduits as herein provided, said Lighting Commission shall prescribe and determine the street or streets in which it shall be lawful to erect or construct lines of wires above ground and lay conduits in the ground, and no person shall erect any pole or train any wire for such lines above or in the ground in any street, alley or highway, excepting the same be authorized by such permit. Any person violating the provisions of this section shall be punished by a fine not exceeding five hundred dollars, and in the imposition of such fine the court may make a further sentence that the offender be imprisoned in the Detroit House of Correction until such fine be paid; provided, the term of imprisonment shall not exceed the period of six months.

Sec. 7. Any permit hereby authorized shall not become operative and authorize the construction of any line of wires above ground, or the laying of any conduits until the person, persons or corporation to whom the same may be granted, shall have filed with the City Controller a satisfactory bond, to be approved by the Controller, in the sum of twenty-five thousand dollars (\$25,000), conditioned that the person, persons or corporation to whom such permit is granted will faithfully comply with and perform the terms and conditions of this ordinance, and such person or corporation shall also have deposited and shall keep on deposit with the City Treasurer the sum of two hundred dollars (\$200.00), to cover the expense of the replacing of the earth in making the repairs to pavements required to be relaid by such person or company under the provisions of this ordinance, and as a guarantee for the prompt payment of any bills for such work presented by the Board of Public Works. Such deposit shall be kept good to the amount of two hundred dollars, and on failure to keep the same good to that amount, such permit shall become void.

Sec. 8. Whenever the Public Lighting Commission shall deem it for the public interest they may require as a condition to the issuing of any permit that the wires shall be laid in the public conduits, and if any wires shall be strung on poles along any highway and public conduits shall afterwards be laid therein, said commission may require the wires so strung upon poles to be taken down and in their stead suitable wires put in the public conduit, and upon any refusal to do so may remove the same. Said commission may prescribe the terms and conditions upon which the public conduits shall be used for such purpose.

Sec. 9. Any rights acquired under any such permit shall cease whenever the Common Council shall so direct, and all poles and wires shall thereupon be removed at the expense of the person, persons or corporation erecting or controlling the same.

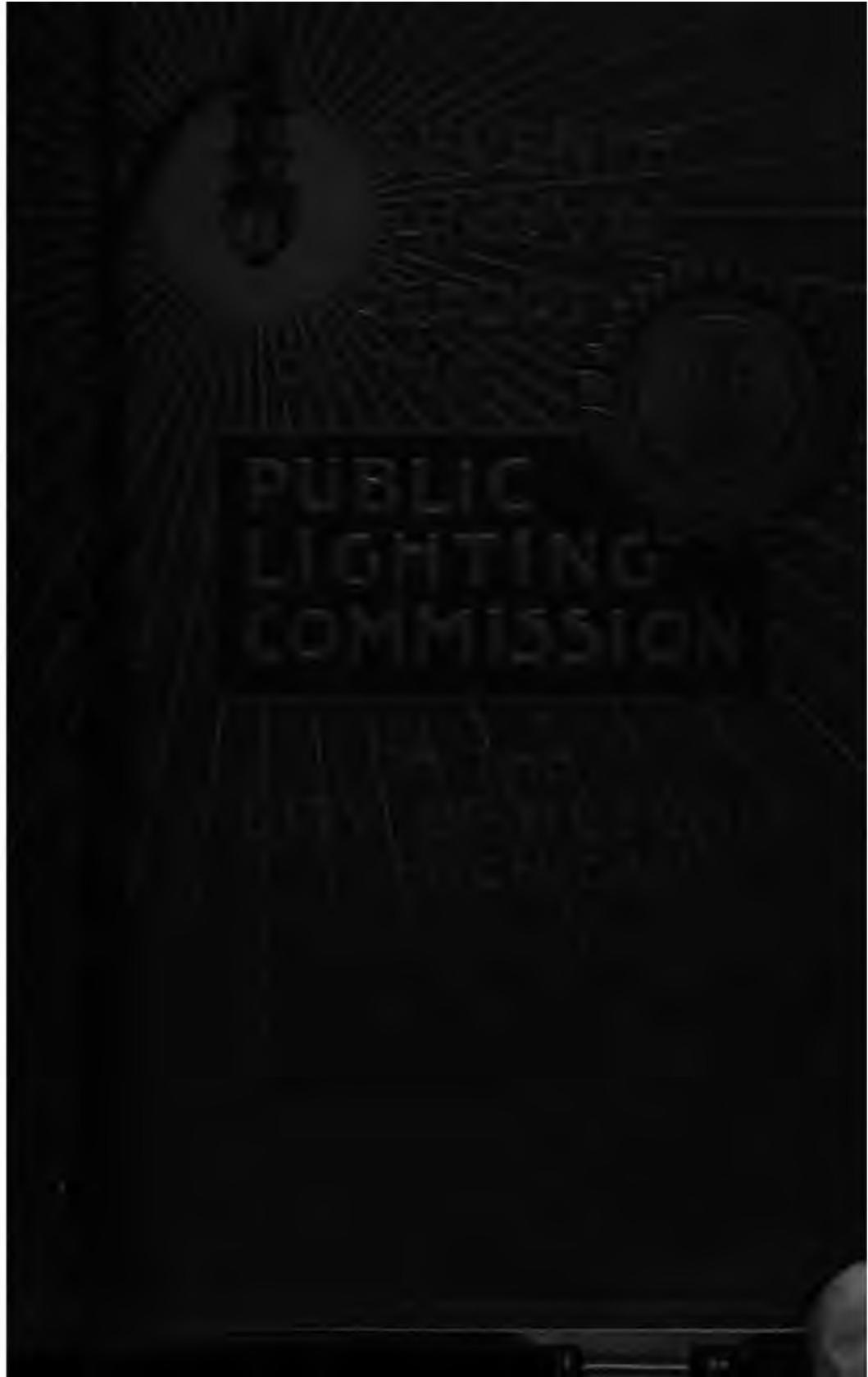
Sec. 10. When any wires erected under any such permit shall interfere with any wires of the Public Lighting Commission, or with any telephone or telegraph wires of the Fire Commission or of the Police Department or other public service wires, the Public Lighting Commission may direct the removal of the same, or such alterations in relation thereto as will obviate or prevent such interference. When any person or corporation shall have erected a pole on any portion of the street or alley it shall be subject to the conditions that the Public Lighting Commission may authorize other persons or corporations to whom such permits may be granted to use such pole already erected and upon such terms and conditions as the Public Lighting Commission may direct.

The Public Lighting Commission may require that all poles shall be used to their maximum capacity and the lines thereon so distributed as to obtain such result. The Public Lighting Commission may require any person, persons or corporation occupying a certain right of way with line or lines of poles of insufficient capacity to accommodate the requirements of that locality to replace said poles with such other poles as may be approved by the Public Lighting Commission.

Approved December 3d, 1900.



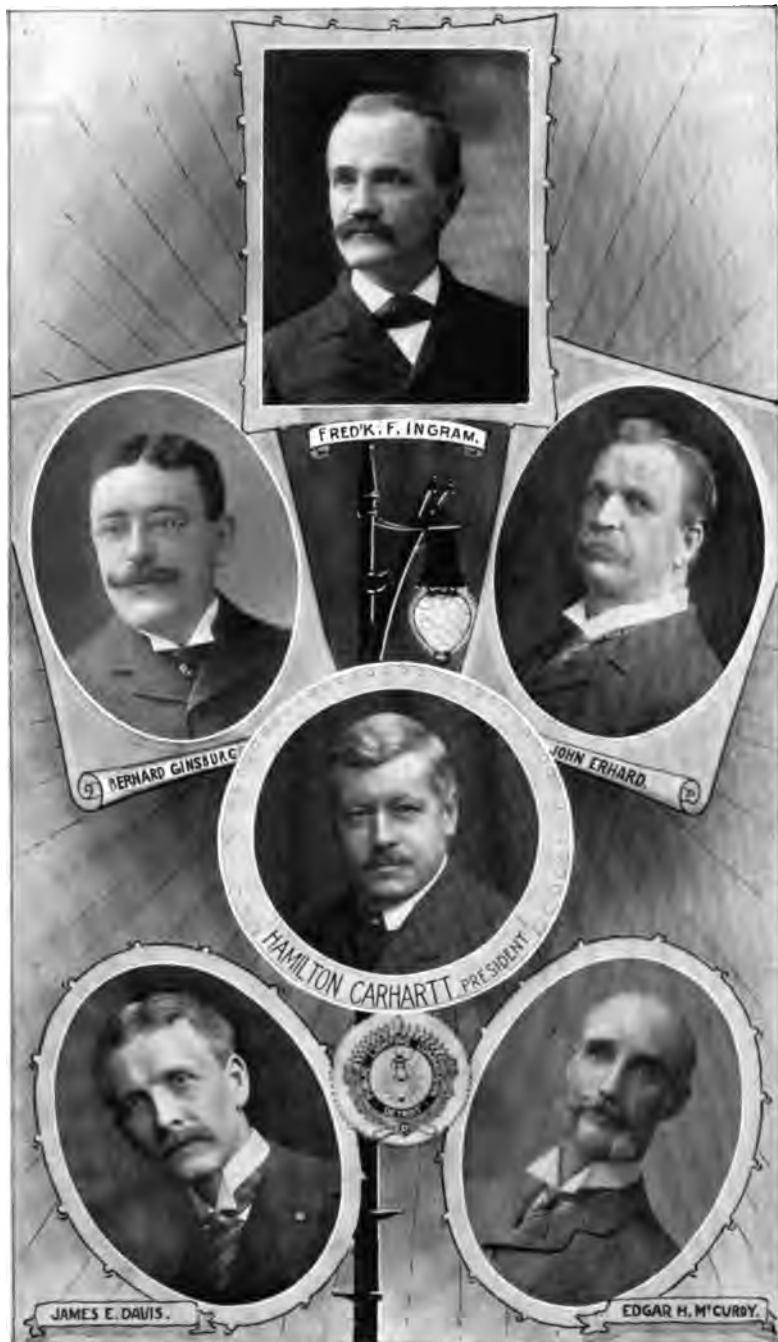








OFFICE AND STATION BUILDINGS.



PUBLIC LIGHTING COMMISSIONERS, 1902.

SEVENTH ANNUAL REPORT

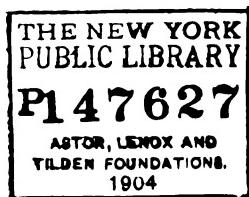
OF THE
Public Lighting Commission
CITY OF DETROIT.

Fiscal Year Ending June 30th, 1902.

THE COMMISSION.

HAMILTON CARHARTT, President.....	Term expires April 4, 1907
JOHN ERHARD, Vice-President.....	Term expires April 4, 1906
JAMES E. DAVIS.....	Term expires April 4, 1903
FREDERICK F. INGRAM.....	Term expires April 4, 1904
BERNARD GINSBURG	Term expires April 4, 1905
EDGAR H. McCURDY.....	Term expires April 4, 1908
FRANK T. BOWLER.....	Secretary.
WILLIAM M. DALY.....	City Electrician and Gen'l Supt.
AUSTIN S. HATCH.....	Assistant Gen'l Supt.
Custodian of Funds.....	WM. B. THOMPSON, City Treasurer.
Auditor of Accounts.....	F. A. BLADES, City Controller.
City Accountant.....	FRANCIS J. DUCAT.





The Ex-Members of the Commission are:

C. A. NEWCOMB, April, 1893, to July, 1893.
MARTIN BUTZEL, April, 1893, to March, 1895.
GEORGE H. LOTHROP, April, 1893, to April, 1896.
W. A. JACKSON, April, 1893, to July, 1896.
EDWIN HENDERSON, April, 1896, to December, 1896.
W. R. FARRAND, April, 1893, to April, 1897.
J. L. HUDSON, April, 1893, to May, 1898.
JOHN ATKINSON, July, 1896, to July, 1898.
R. H. FYFE, July, 1893, to October, 1899.
C. H. RITTER, March, 1895, to January, 1900.
JOHN MINER, December, 1896, to January, 1900.
W. A. LIVINGSTONE, April, 1897, to January, 1900.
DAVID W. SIMONS, July, 1898, to July, 1902.



SIX LIGHT TOWER ON CAMPUS MARTIUS



MAST ARM



DETROIT, MICH., July 31, 1902.

TO THE HONORABLE THE COMMON COUNCIL,
City of Detroit, Michigan.

GENTLEMEN—The Public Lighting Commission respectfully submits for your consideration the accompanying report of the business intrusted to its care during the fiscal year ending June 30, 1902.

In the report an effort has been made to present such data as will best convey an understanding of the work done, the cost of municipal lighting and the condition of the city's investment.

We have the honor to be,

PUBLIC LIGHTING COMMISSION,
By HAMILTON CARHARTT, President.
FRANK T. BOWLER, Secretary.

Office of the Public Lighting Commission.

Detroit, Mich., Nov. 11, 1902.

To the Hon. Public Lighting Commissioners, and Citizens of Detroit:

Gentlemen:—

I submit the seventh annual report of the business and operation of the Public Lighting Plant, covering the fiscal year ending June 30, 1902.

To those who are considering the feasibility of Municipal Ownership of Public Utilities, I feel that our Public Lighting Plant, which is now entering the seventh year of its existence, is an object lesson of more than passing moment.

Careful and economical management, with politics and favoritism eliminated and a harmonious Board devoted to interest of the public, has continued, as in the past, to be the policy of the board.

The entire maintenance and operating cost for the last fiscal year was \$99,087.16, as compared with \$99,094.62 for the preceding year, showing a decrease of \$7.46. The output of the plant, however, was 4,323,849 Kilowatt Hours as against 3,973,350 Kilowatt Hours last year, showing an increase in the output of 350,499 Kilowatt Hours.

The following table will show the ratio of decreased expenditures among the different departments:

	Wages.		Stores.	
	Increase.	Decrease.	Increase.	Decrease.
Maintenance	\$	\$1,573.19	\$	\$2,163.99
Executive	858.29	.....	.....	199.40
Station	1,383.64	.....	.....	32.54
Lighting	845.36	.....	1,125.39	.....
Shop supplies .....	.....	.....	.....	52.20
Injuries and damages.....	.....	44.12	.....	154.70
 Totals	\$3,087.29	\$1,617.31	\$1,125.39	\$2,602.83
Total decrease .....	.....	.....	.....	\$4,220.14
Total increase .....	.....	.....	.....	4,212.68
 Net decrease .....	.....	.....	\$ 7.46	.....

The total output of the plant for the year was as follows:

For arc lighting..... 3,672,255 Kilowatt Hours.
For incandescent lighting..... 651,594 " "

Making a total of..... 4,323,849 " "
Total for preceding year..... 3,973,350 " "
Average number of 2,000 candle power arc lights..... 2,133
Same for preceding year..... 2,035

The Commission, upon careful consideration, have found no reason to change the method of arriving at the actual cost of an arc light per year to the city.

To the cash cost of operating the plant is added the fixed charges, as follows:

*Depreciation on the entire investment of \$802,438.93, at an average of 3%, June 30th, 1902.....	\$ 24,073.17
Interest on the net investment, July 1st, 1901, \$721,861.56, for one year at 4%.....	28,874.46
Lost taxes (the amount the city would get as taxes were the plant owned by a private corporation) are figured by charging to the operation of the plant at the regular rate of taxation for the city county and state. The probable assessed value based upon a comparison with the assessed values of other plants of like character, similarly located in the city, is placed at \$389,183.00. This amount at \$21.23 per \$1,000 is.....	8,262.35
Cash cost of operation is.....	99,087.16

Making a total cost of.....\$160,297.14

Total cost proportioned between arc and incandescent plants according to output of each is as follows:

Arc plant	\$136,140.73
Incandescent plant	24,156.41
Total	\$160,297.14

Cost of operation per arc light (cost of operation divided by average number of lights, 2,133).....	\$63.82
Cost per arc light subdivided—	
Operating disbursements	\$39.45
Interest at 4% on investment.....	11.49
Depreciation at 3% on investment.....	9.59
Lost taxes on investment.....	3.29

Total	\$63.82
Gross cost per arc light, fiscal year ending June, 1901.....	\$67.31

Decrease	\$ 3.49
Cash cost per arc light, fiscal year ending June 30, 1902.....	\$39.45
Cash cost per arc light, fiscal year ending June 30, 1901.....	42.59

Decrease

*Being the average on the different items of property as shown by the actual depreciation of different types, varying from 7% on incandescent plant, arcs and switches, 5% on steam plant, etc., to nothing on land.
Notwithstanding percentage added to cost for depreciation, maintenance, repairs and replacement cost is also charged to operating.

As has been shown in reports of previous years, the gross cost of operation to the Commission is by no means the measure of the cost of public lighting to the citizens of Detroit. Certain incomes accruing to the Commission go to reduce the actual cash cost of operation to the taxpayers, while a saving of expenditure formerly made by other agencies of the city government and now saved by virtue of the existence of this Commission make a further reduction in cash cost.

These items may be summarized as follows:

Proportion of time of City Electrician and Assistant now saved by Commission, per annum.....	\$1,200.00
Collections from rentals.....	6,775.61
Total	\$7,975.61

Averaging this deduction from the cash cost reduces the cash cost per arc light from \$39.45 to \$36.28.

I append an interesting comparison between our Municipal Lighting Plant and the contract system in vogue in the other cities mentioned, as shown in City Controller's report of the City of Detroit for year 1901:

	Detroit.	Cleveland.	Buffalo.	Cincinnati.	Pittsburg.
Arc lights	2,035	921	2,587	3,460	2,530
Incand. lights	6,948	2,719	None	None	None
Gas lights	None	2,962	5,831	2,268	None
Vapor lights	None	2,407	None	766	None

Total cost \$156,603.60 \$259,227.90 \$338,925.25 \$326,626.22 \$350,000.00

Americans have much to learn from England, in regard to municipal rights and privileges. Manchester owns its telephone system; Sheffield, its street railways; London, builds lodging houses and rents them to poor families; Birmingham makes its gas, manages its sewer farm, has public swimming and Turkish baths and laundries, lets out flats and shops. All these municipal enterprises show a profit and diminish taxes. Sooner or later every city must be conducted on business principles, but it is remarkable that conservative England should be the first to set the example and that we, who pride ourselves upon our progressiveness, should lag so far behind.

Our Commission is authorized to do public lighting only: were we permitted to do commercial work as well, statistics show that we could place an eight candle power light, in the humblest home, at a cost for light of about one-quarter of one cent per hour. Were we allowed to do this work and charge the going price per K. W., we could light the city for nothing, and have a handsome balance in our treasury at the end of each year. If the citizens of Detroit were fully aware of the delights and comforts they have within their grasp, from their Public Lighting Plant, I think they would insist that it be allowed to serve them.

In spite of the increased cost of material and increased wages, during the past year, the cash cost per arc light per K. W. per hour was the lowest of any year in the life of the Commission.

Two years ago, this Commission, acting upon the belief that the same low cost per lamp, which has characterized its management, could be maintained, at the same time wages to faithful employees increased, developed a system whereby the plant could be enlarged, according to modern methods and its efficiency greatly increased.

Our employes work the legal work day of eight hours, and in view of the fact that their duties require their services every day in the week, the Board have granted them an annual vacation of ten days on full pay. This treatment brings the best possible results, shown in the loyalty of our assistants, from the superintendent throughout.

As a result of our plan, the past year has been one of greater extensions than any other in the history of the plant. Our arc lighting has been increased over 12% and the incandescent lighting by the unprecedented amount of 71%.

Our incandescent lighting now includes all the public buildings of the Police and Water Departments, as well as many of the schools and fire engine houses; the rest of the latter will be served as soon as they can be reached in an economical manner.

As we understand it, this Commission was created for the purpose of furnishing light to the streets and public buildings of the city of Detroit, but up to one year ago almost all the fire, police and school buildings outside of the half-mile circle, from the City Hall, were being expensively served by contract.

To reach this outlying district in the most economical manner was a mooted question. It was finally decided to install sub-stations with high tension feeders, from the main station, for the purpose of distributing both arc and incandescent lighting.

For economy in this respect, sub-stations are a positive necessity, as to distribute light entirely from the main station would require a large extra investment in conduits and cables.

Another great advantage of sub-stations lies in having an operator in charge on call, throughout the 24 hours. Such an operator, with a supply for repairs convenient, could take care of any trouble in the service immediately, saving the time and expense of sending men and material from the main station.

The first station was established in the basement of the Western High School, and controls 320 arc, 800 incandescent lamps, and 15 horse power in motors.

Another sub-station should be located at our pole yard, where line material could be kept, saving extra trips of the line wagon to the main station.

A store-room with living rooms above could be built at this yard, with accommodations for all heavy line supplies, as well as room for stabling, at a cost of, in the neighborhood of \$3,000.00.

In connection, I desire to say, that the Commission should own its sub-stations. Space to be secured on the property of other departments is limited, and the danger from high tension currents can be guarded more zealously if we are on our own property.

Our pole-yard, at present, is on ground owned by the Water Commission, and is liable to be sold at any time, and there is urgent need that we secure our own site for a sub-station at the earliest possible moment.

Another and crying need is that we have more warehouse facilities and greater storage for coal.

Every nook and corner is now being used for storing supplies, making it difficult for our store-keeper to keep track of all the supplies taken out.

Many of our extension supplies have to be stored in rented sheds or left out of doors, a prey to the weather and vandalism.

This condition makes it expensive, owing to the delay the construction gangs are put to, for getting their supplies.

The wages of a construction gang are something like \$2.50 per hour, and it is easy to see the extra expense incurred by not having their wants supplied at once.

Instead of having a well-stocked and orderly store-room, we can only keep a little stock, and that in the basement, boiler room, alley or on our third floor.

So limited is our storage capacity for coal, that if by any chance the railroad companies could not deliver coal regularly, we would be unable to keep the plant running, as we have storage for a few days only.

Adjacent to our plant is a half block, overlooking the river, partly incumbered by old buildings. I strongly urge this Commission to use every means in their power to have the city acquire this property, which can be done now more advantageously than at any other time.

Upon a portion of this property we could build, at a cost of say fifteen thousand dollars, a warehouse wherein could be carried a substantial stock of our small supplies.

Large storage bins for coal could then be erected. Underneath them could be stored our heavier materials.

The economies these changes would allow us to make would more than offset the extra expense incurred.

Upon the portion of the property above mentioned not needed by the Commission, I would recommend that the city erect a commodious public bath-house. Situated as we are on the beautiful Detroit river, the absence of a public bath-house is greatly emphasized.

New York City is building at once, three big free baths, for the use of men and women, at a total cost approximating \$225,000. Each bath will be two stories high with a basement, the facades being of brick, granite and limestone, with two large entrances, one for men and the other for women, each entrance flanked with lamps of ornamental metal.

The first floor in each bath will be set aside for the accommodation

of women and the second floor for the use of men, and each will be completely equipped with showers and other appurtenances.

Operated in connection with our lighting plant the expense would not be great, and this would be entirely covered by a small charge of say five cents for the privileges extended to each person.

In order to have our plant complete and up to date, we should continue to greatly extend our lighting service.

A glance at the map of the city will show that between the half and the two-mile circle from the City Hall, there are lamps at nearly every corner, but outside of the two-mile circle lamps are scarce indeed, and on many well-built streets they are one-half mile apart.

Nearly all the new lamp locations asked for are outside of the two-mile circle, and we have nearly 700 on file. For this reason we should put in at once a large number of lamps to meet the demand created by the natural growth of the city.

In the original scheme for lighting the city, towers were used almost exclusively. These, while beautiful when viewed from a distance, are inadequate for the purpose for which they are installed. High buildings have been erected which destroy their usefulness, in some instances, and dense foliage to a very great extent in others; consequently, we are confronted with dark streets, that should be obviated at the earliest possible moment. By installing lamp posts in these sections, we could remove the tower to the outlying districts, where, there being unobstructed, their efficiency could be greatly increased and the public better served.

Belle Isle should come in for substantial extensions, both in arc and incandescent lighting. This is one of the great pleasure resorts of the world and for this beauty spot Detroit is known everywhere.

In spite of the pride we take in this island, with the exception of the main central avenue and a few lights around its lower or western end, it is without light whatever, the absence of which on the main drives are especially marked.

The completion of the aquarium will overload the feeder to the island, so it will be necessary to increase the incandescent lighting service. This, with an increase in the arc service mentioned, will require a larger sub-station.

Palmer Park requires lighting, quite as much as Belle Isle, but has no light now whatever. Service to this park should be installed at once, and should be underground, both for safety and security in operation.

Fortunately for the Commission, these needs for improvement in the lighting of the city will not require extensive alterations at the main station for supplying them; all that will be necessary will be increased boiler capacity, together with the larger storage for coal before mentioned.

In connection with the improvements noted, we should extend our underground service. The law requires that all wires within a half mile of the City Hall shall be underground, but since the life of the plant this

Commission has had a line of poles with overhead wires within this prescribed district, in direct violation of this ordinance.

Two years ago a portion of the surplus funds was used to put the west side line underground, leaving the eastern line still overhead. Aside from permanency in underground service we secure a greater flexibility in overhead distribution, so that should a fire disable a trunk line, the lighting could still be supplied by cross-town tie lines the same as explained in connection with the western sub-station. The cost to accomplish this in a satisfactory manner would be in round numbers \$10,000.

We now have eleven telephones; one, the trouble 'phone, No. 4343, has free service from public pay stations; another is a fire department 'phone, giving connection to police and fire lines. On account of interruptions and the inability to always secure connections, we could greatly improve our lighting service both in operation and maintenance with our own exchange of 25 numbers, costing, if connected with the police and fire department telephone system, about \$2,500.

We have no law controlling the stringing of wires in our streets, consequently our city is covered with tramp wires strung from building to building with occasionally a contact on some company's pole. This year we found more than 10 per cent of the foreign contacts on our poles were unclaimed, compelling us to find owners for them. These wires are dangerous to life and property and some day there is a possibility that the city will be compelled to pay damages as a result of such lack of legislation. There was a bill introduced in the last legislature, giving authority to this Commission to control all wiring and erection of poles in the city, but it was defeated by interested parties. On April 30th, 1901, an ordinance was introduced in the Common Council to partially regulate this trouble. It was left on the table until September 6th, 1901, when it was brought up for final action, but on account of a communication from the Department of Public Works it was referred back to the committee and no further action has been taken.

Desiring to thank you for following me to this length and wishing to compliment my fellow Commissioners upon their unswerving and self-denying devotion to the public's interests, I am,

Yours respectfully,

HAMILTON CARHARTT,

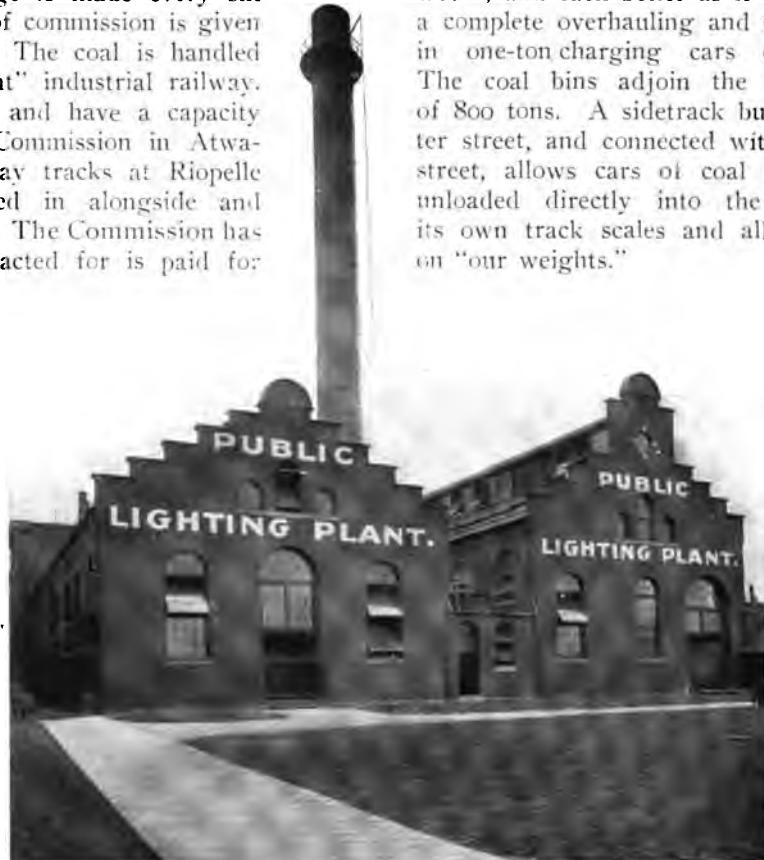
President.

The City's Lighting Plant.

The property owned and controlled by the Public Lighting Commission now consists of the following:

The power house and office building located on Atwater street, between Bates and Randolph, having a frontage on Atwater street of 213 feet, 163 feet of which extends back an average of 318 feet 6 inches to the river front and 50 feet of which on the east extends back only a distance of an average of 68 feet. (The complete plan of the station will be found on page 27.)

The boiler house contains seven Double Deck Tubular Boilers, C. C. Peck design. Each boiler has 3,000 square feet of heating surface and is equipped with the Hawley Down Draft Furnace and Hoppes Live Steam Purifier and Worthington Water Meter. Five of these boilers are used at one time to operate the plant, the other two being kept in reserve. A change is made every six weeks, and each boiler as it is put out of commission is given a complete overhauling and cleaning. The coal is handled "Hunt" industrial railway. The coal bins adjoin the firing floor and have a capacity of 800 tons. A sidetrack built by the Commission in Atwater street, and connected with the railway tracks at Riopelle, allows cars of coal to be pushed in alongside and unloaded directly into the coal bins. The Commission has contracted for its own track scales and all coal is paid for on "our weights."



REAR OF POWER HOUSE.

The Pump Room contains: One Fire Pump of 1,000 gallons per minute capacity. This pump is connected to a complete system of fire mains and is always under steam. It is used during the day to feed the boilers and to operate a water motor which runs the machine shop.

One Worthington Pressure Pattern Feed Pump, in reserve, of 100 gallons per minute capacity. This is connected to a duplicate boiler feed system.

Two Worthington Jet Condensers, with feed pumps attached. Either condenser will condense 36,000 pounds of steam per hour, and the auxiliary feed pump can feed the same amount of water to the boiler. All of the water used in the operation of the plant is pumped by the above machinery from the Detroit river.

One Wainwright Heater, which utilizes the exhaust steam from the pumps and small engines in heating the boiler feed water.

One Westinghouse Air Compressor, which supplies the compressed air for cleaning machinery.

The Engine Room contains the following:

ARC LIGHTING PLANT:

Five triple expansion, marine type engines; 200 revolutions per minute; 160 pounds steam pressure; 25-inch vacuum; cylinders, 11½-inch, 18 inches and 29 inches in diameter, and 18-inch stroke; horse power at maximum efficiency is 340.

Twenty 50-kilowatt, four-pole Western Electric Co. Arc Dynamos for constant current at 9.6 amperes; speed, 500 revolutions per minute. Four dynamos are driven by each engine, the connection being 7 ½-inch cotton ropes to each dynamo.

Three 57½-kilowatt, two-pole Western Electric Co. Arc Dynamos for constant current at 9.6 amperes; speed, 465 revolutions per minute. Each dynamo is direct connected to a 100 horsepower, triple expansion Willans center-valve engine.

One 7-kilowatt, two-pole Brush Arc Dynamo; 1,080 revolutions; 6½ amperes; belt connected to same Westinghouse Compound En-



PUMP ROOM



DOWNTOWN POST.

gine as operates one Westinghouse alternator. This machine furnishes current for a small circuit of enclosed arc lamps.

INCANDESCENT LIGHTING PLANT:

Three Compound Westinghouse engines, run non-condensing; cylinders, 9-inch and 15-inch, with 9-inch stroke; speed, 350 revolutions per minute.

Two excitors, one belt-driven and one direct-connected to a Westinghouse Standard Engine.

One Triple-Expansion Marine Type Engine, cylinders 17x27x46 inches diameter and 30-inch stroke, 120 revolutions per minute, 160 pounds steam pressure, 1,000 horse-power maximum, at 26-inch vacuum, and direct connected to a 600-kilowatt two-phase Stanley Alternator, at 2,200 volts each phase.



DOUBLE POST—UNDERGROUND DISTRICT.

One 175-kilowatt Stanley two-phase Alternator, 2,200 volts at 500 revolutions per minute.

One 40-kilowatt Northern Electric 125-volt direct current dynamo, at 325 revolutions per minute, to be direct connected to Westinghouse engine, and used as an exciter.

ARC LAMPS:

The 2,302 arc lamps in use are subdivided as follows:

- 1,761 "Brush" double carbon.
 - 196 "Adams-Bagnall" single carbon.
 - 2 "Adams-Bagnall" enclosed arc.
 - 6 "General Electric" enclosed arc.
 - 337 "Western Electric" enclosed arc, alt. current.
-
- 2,302



POLES AND LINES:

The overhead lines of the plant are strung on a total of 7,382 poles, owned

as per the following table. On these poles the Commission has strung a total of 463 miles of copper wire.

Number of poles used by Public Lighting Commission and owned as follows:

	Increase.	Annual Report 1902.	Annual Report 1901.	Decrease.
Public Lighting Commission.....	133	5,997	5,864	..
Fire Commission	48	629	581	..
Police Commission .....	..	420	459	39
Edison Illuminating Co.....	173	239	66	.
Michigan Telephone Co.....	..	75	126	51
United Railway Co.	8	22	14	..
	—	—	—	—
	362	7,382	7,110	90

Net increase, 362—90=272.

The poles of the Public Lighting Commission are used by other parties as follows:

	Increase.	Annual Report 1902.	Annual Report 1901.	Decrease.
Fire Commission .....	..	1,262	1,382	120
Police Commission	87	960	873	..
Edison Illuminating Co.....	512	1,911	1,399	..
Michigan Telephone Co.....	..	757	1,894	1,137
East Side Electric Co.....	9	95	86	..
Detroit Still Alarm Co.....	117	286	169	..
United Railway Co. ....	..	435	523	88
Michigan Auxiliary Fire Alarm.....	46	46	...	..
Detroit Shipbuilding Co.....	..	1	1	..
Parke, Davis & Co.....	..	1	1	..
Western Union Telegraph Co. ....	..	1	1	..
	—	—	—	—
	771	5,755	6,329	1,345

Net decrease, 1,345—771=574.

THE UNDERGROUND SERVICE—CONDUITS:

The conduits vary in size from 2 ducts to 24 ducts. The ducts are a special $3\frac{1}{2}$ -inch vitrified clay tile laid in concrete.

The total amount of conduits is as follows:

Size of Line.	Length of Line.	Lineal ft. of single ducts.
2 ducts	1,387 ft. 2 in.	2,774 ft. 4 in.
3 ducts	1,128 ft.	384 ft.
4 ducts	6,451 ft. 5 in.	25,805 ft. 8 in.
6 ducts	2,543 ft. 7 in.	15,261 ft. 6 in.
9 ducts	21,662 ft. 9 in.	194,964 ft. 9 in.
10 ducts	138 ft. 1 in.	1,380 ft. 10 in.
12 ducts	95 ft.	1,140 ft.
15 ducts	560 ft. 10 in.	8,412 ft. 6 in.
16 ducts	2,104 ft. 8 in.	33,674 ft. 8 in.
24 ducts	347 ft. 2 in.	8,332 ft.
Tunnel, 6 ft. 2 in. x 3 ft. 6 in.....	231 ft.	
Tunnel, 5 ft. x 3 ft.....	96 ft.	
Manholes, 169	932 ft. 7 in.	
<hr/>		
Totals	36,678 ft. 3 in.	292,130 ft. 3 in.

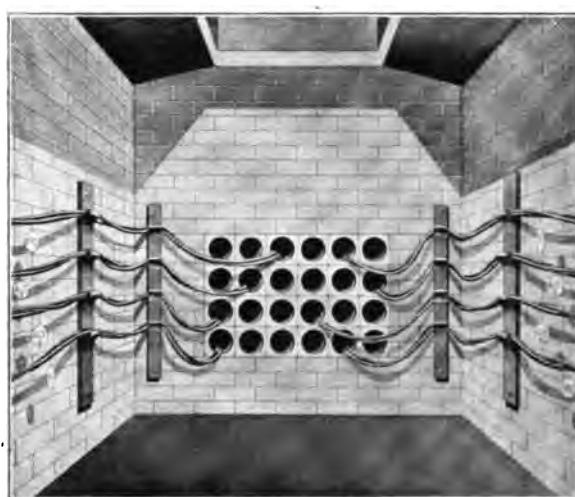
LATERAL CONDUITS:

Consisting of $2\frac{1}{2}$ in. lap welded iron pipe..... 44,658 ft.
351 Handholes, 3 ft. in length..... 1,053 ft.

Total 45,711 ft.

Of the above conduits in the streets of the city, the Commission has rented the following:

Edison Illuminating Co..... 9,808 5/6 duct feet.



UNDERGROUND MANHOLE.

The rates charged for rental of conduits are as follows:

For single duct, 5c per foot per annum.

For two ducts paralleling each other, 9c for the two ducts per foot per annum.

For three ducts paralleling each other, 12c for the three ducts per foot per annum.

All such rentals are subject to the Rules and Regulations adopted by the Commission May 25th, 1897.



TUNNEL UNDER WOODWARD AVENUE,
AT CAMPUS MARTIUS.

In the conduits the following lead covered, rubber insulated cables are used as conductors:

Arc lighting circuits, No. 4, B. & S. gauge.....	216,440 ft.
Incandescent feeders, No. 4, B. & S. gauge.....	36,576 ft.
Incandescent mains, No. 8, B. & S. gauge.....	29,746 ft.
Incandescent feeder, No. 0, B. & S. gauge.....	3,000 ft.
Total	285,762 ft.

All of the wires of the lighting system within the half-mile circle and a great portion of them inside the mile circle are under ground.

BELLE ISLE PARK:



POST—BELLE ISLE PARK.

116 volts. The crossing of the three-phase feeder and the connection of the sub-station is accomplished by the use of 14,500 feet of No. 6 B. & S. gauge three-conductor, lead covered and rubber insulated cable, a part of which is armored with iron wire and placed under the river. The secondary mains connecting the several buildings with the sub-station are made up of 5,800 feet of No. 00 two-conductor and 1,100 feet of No. 1 two-conductor rubber insulated and lead covered cable and 3,000 feet of No. 4, single conductor cable. •

The second sub-station, known as station "C," is located at the Western High School, 3 miles from the main station, and is equipped with switchboards, transformers and meters in order to control and register the current used for both arc and incandescent lighting in the west end of the city. The

Belle Isle, the principal city park, an island 700 acres in extent, located at the head of Detroit River and opposite the eastern end of the city, is lighted by the Commission entirely. All the wires are underground, 52,000 feet of 3½-inch wood conduit having been laid for this purpose, nearly one-half of which is still available for pulling in of cables. The bridge to the Island and the more important points on the main roadways are lighted by arc lamps, supported on ornamental iron posts. Fifty-eight arc lamps are used and they are operated until 12 midnight as a part of the regular city circuits. Twenty-five thousand feet of No. 4 B. & S. gauge lead covered cable is used for this service.

The buildings in the park are lighted by incandescent lights, the current for which is obtained from mains connected with the sub-station, where pairs of transformers receive three-phase alternating current at 3,500 volts and deliver two-phase alternating current at



DOUBLE LAMP POST ON BOULEVARD.

service is supplied by a two-phase feeder from the main station, and during the time of street lighting has a potential of 5,500 volts. There are two 25-K. W. transformers stepping down to 2,200 volts for the incandescent service. These, as well as the step-up transformers at the main station, can be cut out by means of oil switches during the day run. As a safeguard against interrupted service, the arc circuits are arranged so each one can be put on either phase, and in case of interruption of the feeders, the incandescent lighting can be supplied by means of cross-town lines through Beaubien, Magnolia and Vinewood avenues.

The lighting in the Water Works Park is done by 14 arc lamps and 200 incandescents. The necessary switches, meters and transformers were installed at the pumping station to control and meter the street and building lights. This is known as station 'D,' and the entire system within the Park is underground, having been installed by the Water Commission at its own expense, this Commission furnishing the current for operation only.

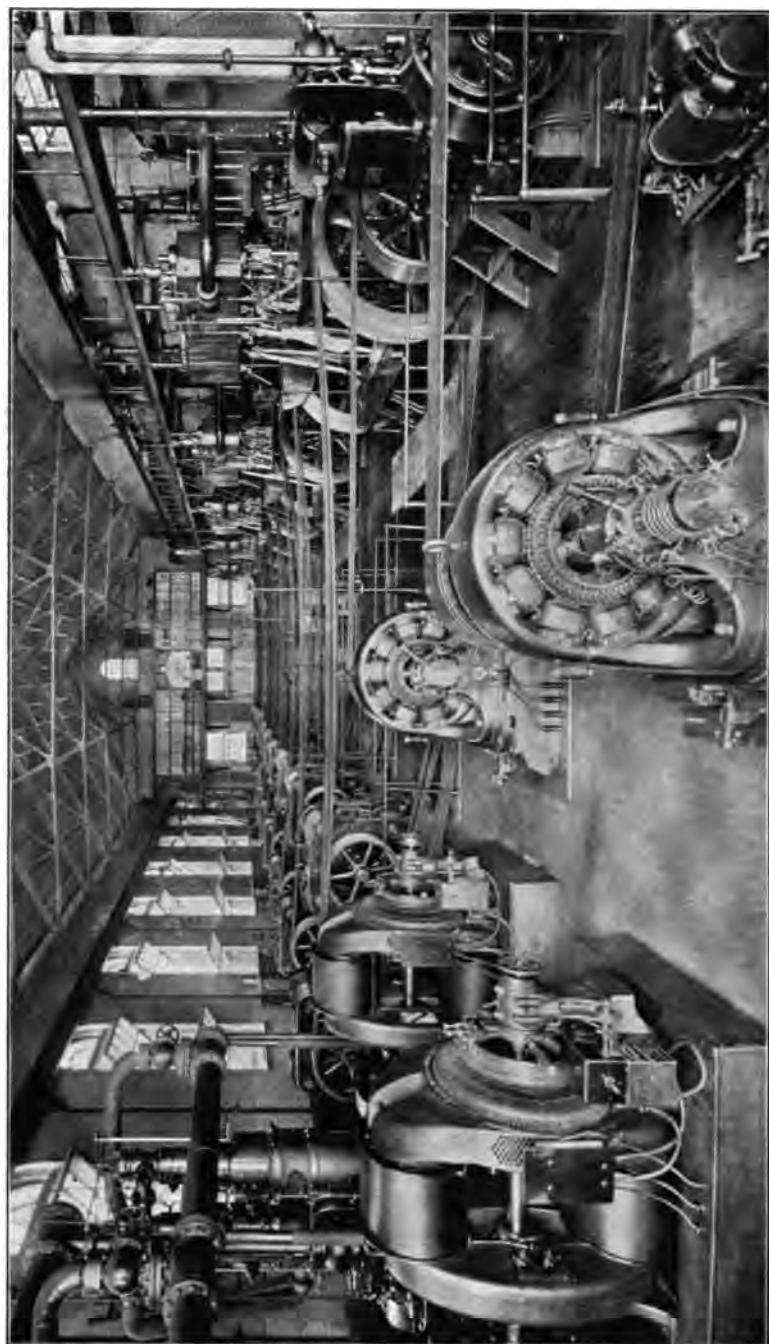
The tower system used by the city in connection with the street lighting is a unique feature. These lights may be seen many miles away by the traveler approaching. The 137 towers in use may be classified as follows:

- 2 165 feet in height.
- 1 160 feet in height.
- 124 150 feet in height.
- 2 125 feet in height.
- 8 100 feet in height.

Total.. 137



CRANE FIXTURE.



GENERATOR ROOM.

Cost of The City Lighting Plant.

The city's investment proportioned between the incandescent and the arc lighting on the basis of the electrical output, is as follows:

	Arc.	Incandescent.	Total.
*Conduits	\$ 80,832.04	\$ 14,342.59	\$ 95,174.63
Cables	47,344.23	8,400.62	55,744.85
Real estate	53,612.21	9,512.79	63,125.00
Buildings and wharf.....	93,597.33	16,607.63	110,204.96
Lines and poles.....	147,638.66	26,196.57	173,835.23
Towers and lamp posts.....	97,981.00	.....	97,981.00
Electric plant, arc.....	71,164.23	.....	71,164.23
Electric plant, incandescent.....	.....	24,835.24	24,835.24
Steam plant.....	109,997.68	19,517.66	129,515.34
Railway tracks and scales.....	9,327.30	1,655.01	10,982.31
Machine shop	6,806.45	1,207.71	8,014.16
Arc lamps and switches.....	65,243.06	.....	65,243.06
 Totals	 \$783,544.19	 \$122,275.82	 \$905,820.01
Belle Isle, lines, cables, lamps, etc.....	.....	26,412.19	
 Grand total .....	.....	\$932,232.20	

*About one-quarter of these are occupied.

Cost Reduced to a Lamp Basis.

Reducing the above investment, exclusive of the Belle Isle, to the amount per lamp on the electrical capacity of the plant, viz.: 2,745 arc of 2,000 candle power, and 7,500 incandescent of 16 candle power, and we have the following:

	Arc.	Incandescent.
Conduits occupied	\$ 7.36	\$.48
Cables	17.25	1.12
Real estate	19.53	1.27
Buildings and wharf.....	34.10	2.21
Lines and poles.....	53.78	3.49
Towers and lamp posts.....	35.69	...
Arc plant	25.92	...
Incandescent plant .....	....	3.31
Steam plant	40.07	2.60
Railway track and scales.....	3.40	.22
Machine shop	2.48	.16
Arc lamps and switches.....	23.77	...
 Totals	 \$263.35	 \$14.86

Public Lighting System Investment.

To June 30, 1902.

The amount expended for investment accounts during the periods specified were as follows:

	Prior to June 30, 1900.	Year 1900.	Year 1901.	Total to June 30, '02.
Conduits	\$ 90,725.17	\$ 1,658.26	\$ 2,791.20	\$ 95,174.63
Cables	38,296.47	17,073.68	374.70	55,744.85
Real estate	63,125.00	.....	.....	63,125.00
Buildings and wharf...	110,004.50	200.46	.....	110,204.96
Lines and poles.....	141,335.27	3,297.80	29,202.16	173,835.23
Towers and lamp posts..	97,536.54	218.50	225.96	97,981.00
Arc plant	60,890.73	58.39	10,215.11	71,164.23
Incandescent plant	13,482.16	149.68	11,203.40	24,835.24
Steam plant	111,849.87	781.05	16,884.42	129,515.34
Railway track and scales.	10,982.31	.....	.....	10,982.31
Machine shop	8,014.16	.....	.....	8,014.16
Arc lamps and switches.	55,663.02	15.60	9,564.44	65,243.06
Belle Isle plant.....	26,182.80	113.41	115.98	26,412.19
 Totals	 \$828,088.00	 \$23,566.83	 \$80,577.37	 \$932,232.20

Depreciation Accounts.

DEBITS.

To investment prior to June 30, 1897.....	\$729,222.73
To investment during year to June 30, 1898.....	60,923.00
To investment during year to June 30, 1899.....	23,657.74
To investment during year to June 30, 1900.....	14,284.53
To investment during year to June 30, 1901.....	23,566.83
To investment during year to June 30, 1902.....	80,577.37
 Total amount charged to investment.....	 \$932,232.20

CONTRA.

(See introductory remarks in annual report of years referred to.)
By amount added to cost of lights for depreciation prior to June

30, 1897	\$ 40,145.73
By amount added to cost of lights for depreciation year ending June 30, 1898.....	22,500.00
By amount added to cost of lights for depreciation year ending June 30, 1899.....	22,534.71
By amount added to cost of lights for depreciation year ending June 30, 1900.....	22,287.22
By amount added to cost of lights for depreciation year ending June 30, 1901.....	22,325.61
By amount added to cost of lights for depreciation year ending June 30, 1902.....	24,073.17

Total amount added to cost of lights for depreciation..... \$153,866.44
Balance present investment June 30, 1902..... \$778,365.76

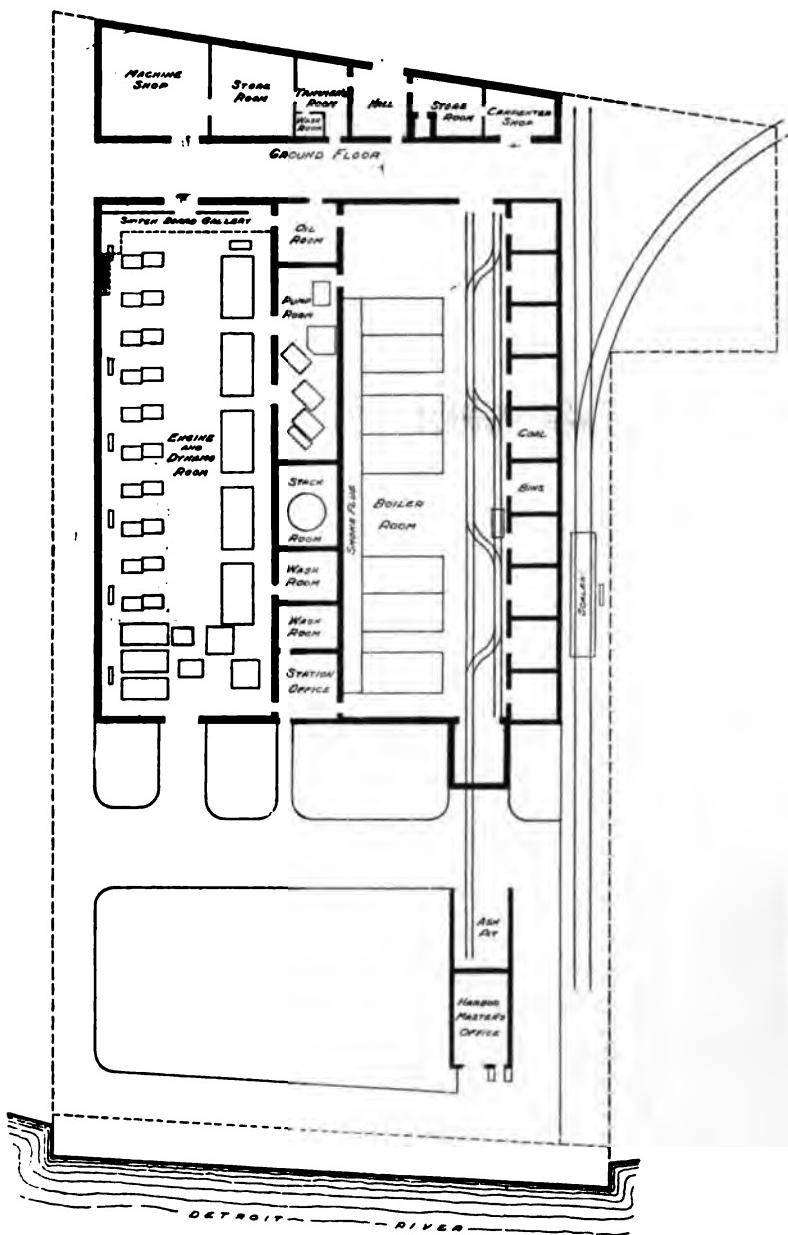
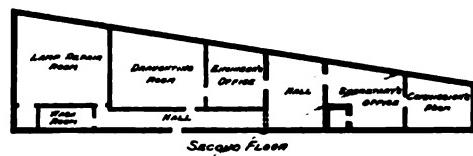
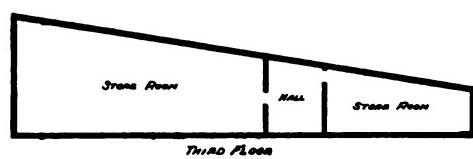
Arrangement of Arc Lamps.

The lighting of the city is done exclusively by means of arc lamps of 2,000 candle-power. The lights are placed on towers, posts and center suspensions, as the conditions demand. The 2,302 arc lamps in operation on June 30th, 1902, were distributed in 1,919 locations, as follows:

955 cranes	955 lamps.
148 center suspensions	148 "
499 mast arms	499 "
168 posts from underground.....	168 "
4 posts from underground.....	7 "
57 three-light towers	171 "
79 four-light towers	316 "
1 six-light tower	6 "
On tower at water works.....	4 "
On base of three towers.....	3 "
In six buildings	25 "
	————— 2,302

Hours of Lighting.

Month.	Total Hrs. Operated.	Av'ge Hrs. Operated.
July	232:30	7:30
August	267:38	8:38
September	298:30	9:57
October	352:00	11:21
November	381:00	12:40
December	408:14	13:10
January	400:37	12:57
February	332:43	11:53
March	326:44	11:33
April	275:10	9:10
May	245:18	7:54
June	223:40	7:10
	————— 3,744:04	————— 10:19



GROUND PLAN OF PUBLIC LIGHTING STATION.

SEVENTH ANNUAL REPORT.

Distribution of Lamps by Wards.

Ward.	Population. 1900.	Increase. 1901.	Assessed Value of Real Estate.		Increase. \$1,025,770 155,990 78,190 229,110 99,210 85,520 233,470 222,600 400,200
			1900.	1901.	
1	16,557	17,110	553	1,072.39	\$31,360,350 7,471,810 6,712,550 5,857,250 7,145,220 5,882,070 1,070.61 6,025,110 1,151.54 2,560.
3	19,248	19,953	705	736.23	7,627,800
5	21,325	21,888	563	636.36	6,790,740
7	18,931	18,688	....	666.48	6,086,360
Decrease 243	9	29,630	30,340	704	875.73
11	20,211	20,996	785	646.14	7,244,430
13	16,446	18,007	1,561	1,025,110	5,967,590
15	10,433	10,906	473	1,151.54	6,258,580
17	11,728	12,741	1,013	6,144,520	233,470
				2,560.	6,367,120
					8,483,260
					400,200
Total E. of Woodward	164,515	170,629	6,114	9415.48	\$84,681,940
2	12,656	12,897	241	836.96	\$36,912,750
4	18,094	18,607	513	937.44	13,490,820
6	20,861	21,223	362	780.58	8,756,350
8	20,292	20,900	608	991.79	8,285,830
10	24,258	24,262	4	979.68	8,350,550
12	19,440	19,706	266	990.79	7,166,480
14	14,869	15,412	543	1,175.36	7,345,580
16	20,130	23,007	2,877	1,456.59	5,792,210
					5,993,720
					5,813,380
					5,878,120
					5,108,210
					241,360
Total W. of Woodward	150,600	156,014	5,414	8,149.19	\$91,084,680
Total in city.....	315,115	326,643	11,528	17,564.67	\$175,766,620
					\$180,442,340
					\$4,675,720
					\$2,145,660
					\$2,230,340

PUBLIC LIGHTING COMMISSION.

29

Public Buildings Lighted.

The public buildings lighted by incandescent lights and the number of 16 candle-power lamps in each are as follows:

	Incand. Lights.	Motors. No. H. P.
Public Lighting Station and Offices.....	405	
*City Hall and County Offices.....	1,631	
Public Library	948	
Municipal Court Building	287	
Board of Health Offices.....	55	
Eastern Market	3	
Capitol Square Fountain	23	
Washington Park Fountain.....	38	
House of Correction	750	
Department of Public Works, Eastern Yard.....	11	
Water Board—		
Offices	132	
Pumping Station	200	
Grounds	39	
	—	371
Police Department—		
Central Station	201	
Gratiot Station	108	
Trumbull Station	69	
Hamlin Station	67	
Woodbridge Station	28	
Grand River Station	111	
Chene Station	56	
Elmwood Station	48	
Scotten Station	40	
Vinewood Station	33	
Fremont Station	45	
Barns	86	
	—	892
Fire Department—		
Engine House No. 1.....	144	
Engine House No. 2.....	40	
Engine House No. 3.....	33	
Engine House No. 4.....	46	
Engine House No. 6.....	38	
Engine House No. 8.....	32	
Engine House No. 9.....	40	
Engine House No. 11.....	16	
Engine House No. 15.....	31	
Truck House No. 2.....	40	
Truck House No. 5.....	53	
Truck House No. 8.....	36	
Telegraph Station	81	
	—	630

Board of Education—

	Inc.	Motors.			
Offices	163				
Washington School	71	2—2 H. P.			
Western High School.....	525	1—2 H. P.			
Preston School	4	3—2 H. P.			
Everett School	85				
Norvell School	123				
Webster School	82				
Russell School	8				
McKinstry School		1—2 H. P.			
Newberry School		{ 1—2 H. P.			
		1—3 H. P.			
Palmer School		1—10 H. P.			
	<hr/>	<hr/>	1,061	10	29
County Jail		295			
County Building	3,450	1—3 H. P.			
		2—6 H. P.—3,450	3	15	
Belle Isle—					
Bath House	101	2—3 H. P.			
Bicycle Shelter	67				
Boat House	32				
Detroit Boat Club.....	160				
Casino	193				
Dock	5				
Barn	107	1—5 H. P.			
Police Station	48				
Skating Pavilion	112				
Miscellaneous	41				
Detroit Yacht Club	64				
	<hr/>	<hr/>	930	3	11
			<hr/>	930	3
				<hr/>	11
			11,780	16	55

*This includes 678 lamps used in decorating, and in "Welcome" signs, operated on an average of three nights a week.

Lamps and Lamp Hours Operated.

The average number of lamps operated each month, with the total lamp hours scheduled, and the lamp hours "Out" during that time, are as follows:

Twelve Months to June 30, 1902.

	Average Number Lamps.	Total Lamp Hours Scheduled.	Total Lamp Hours Out Hrs. Min.
July	2,068	476,027	150 52
August	2,040	536,317	388 04
September	2,036	603,076	246 12
October	2,034	711,051	208 50
November	2,036	768,837	264 28
December	2,071	845,727	1,621 19
January	2,114	843,723	588 38
February	2,183	725,813	681 43
March	2,208	721,373	643 58
April	2,239	616,355	1,062 17
May	2,264	554,420	399
June	2,308	496,819	569 58
Totals	2,133	7,899,538	6,825 19

The corresponding for the 12 months ending June 30, 1901, is as follows:

	Average Number Lamps.	Total Lamp Hours Scheduled.	Total Lamp Hours Out Hrs. Min.
July	2,007	454,539	141 37
August	2,030	532,085	271 12
September	2,031	595,144	939 43
October	2,027	711,939	497 21
November	2,028	760,290	327
December	2,034	827,530	206 53
January	2,045	813,855	325 33
February	2,044	676,355	264 44
March	2,045	671,919	231 21
April	2,040	561,507	457 01
May	2,037	501,363	308 46
June	2,050	445,207	121 08
Totals	2,035	7,551,732	4,092 19

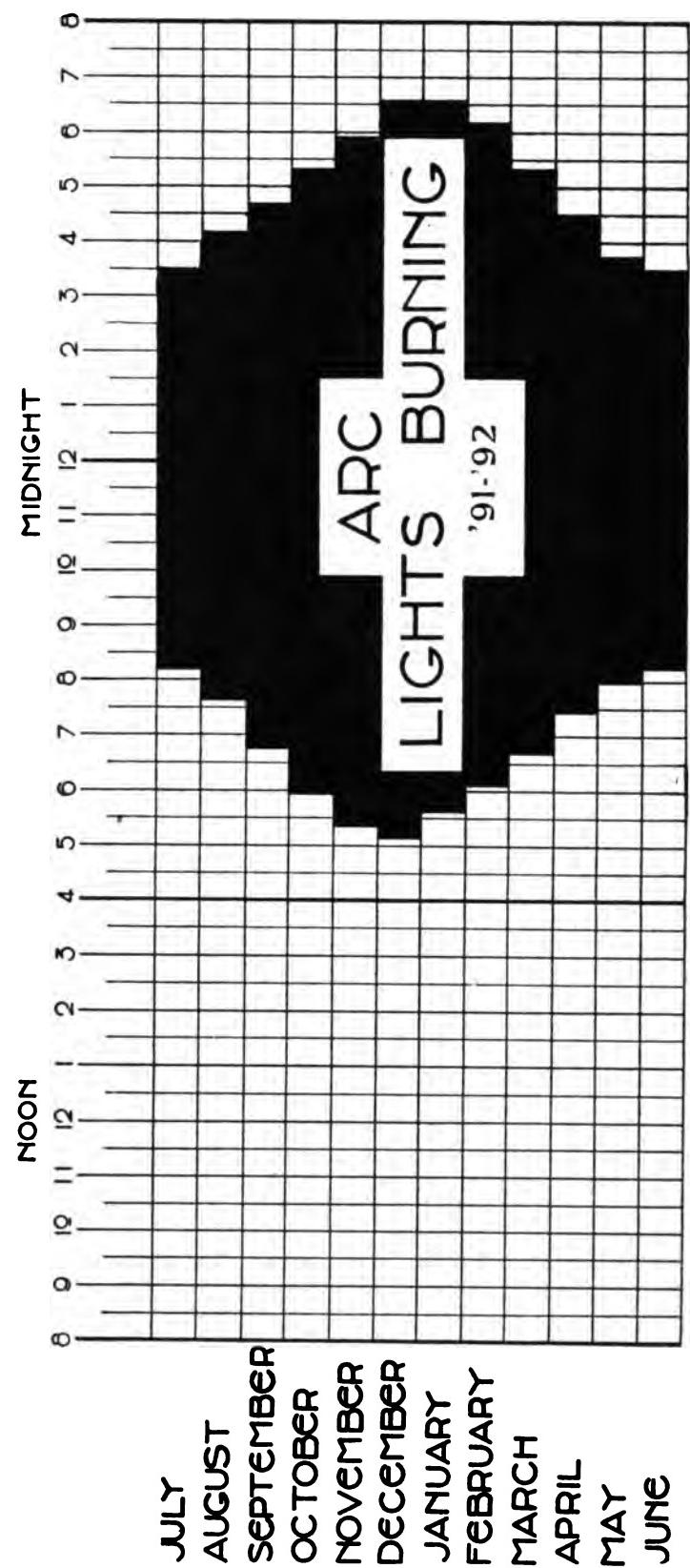


CHART IN BLACK REPRESENTING PERIOD OF ARC LIGHTS BURNING.

Causes of Lamp Hours Out.

The causes of "Lamp Hours Out" for the year ending June 30th, 1902, are summarized as follows:

Month.	Line.			Lamp			Trimmers'			Total.	
	Trouble	Lamps.	Hrs.	Trouble.	Lamps.	Hrs.	Neglect.	Lamps.	Hrs.	Min.	
	Lmps.	Hrs.	Min.	Lmps.	Hrs.	Min.	Lmps.	Hrs.	Min.		
1901.											
July,	3	12	:24	29	117	:56	5	20	:32	37	150:52
August,	76	265	:23	40	120	:26	1	2	:15	117	388:04
Sept.,	4	21	:40	39	213	:12	2	11	:20	45	246:12
October,	1	6	:10	31	196	:20	1	6	:20	33	208:50
Nov.,	2	12	:54	38	245	:07	1	6	:27	41	264:28
Dec.,	129	904	:20	92	716	:59	..	....		221	1,621:19
1902.											
January,		60		550	:30		4	38	:08	64	588:38
February	2	13	:25	89	640	:43	4	27	:35	95	681:43
March,	3	21	:36	81	586	:10	5	36	:12	89	643:58
April,	154	657	:14	87	384	:27	4	20	:36	245	1,062:17
May,	1	33	:40	74	384	:14	3	11	:06	78	399:00
June,	2	9	:25	103	555	:49	1	4	:44	106	569:58
	Total,	377	1,928:11	763	4,711:53		31	185:15		1,171	6,825:19
1901.	110	626	:54	516	2,425	:56	221	1,039	:31	847	4,092:21
1900.	42	138	:56	818	4,151	:47	498	1,848	:12	1,358	6,138:55
1899.	487	2,645	:12	200	1,196	:52	222	1,197	:39	909	5,039:43
1898.	1,479	5,606	:13	129	772	:01	214	1,087	:09	1,822	7,465:23
1897.	108	403	:02	56	358	:15	88	609	:10	242	1,371:07

Trimming Arc Lamps

The work of trimming arc lamps is intrusted to the care of a head trimmer and 19 men. All the single carbon Adams-Bagnall lamps are located in the underground district, which is in the half-mile circle, and are trimmed daily. In the western part of the city are located 304 Western Electric Co.'s series, alternating, enclosed arc lamps, which are taken care of by one trimmer. The Water Works Park is also lit by enclosed arc lamps. The balance are Brush double carbon lamps, supplied with current from overhead lines, and are trimmed every second day. These overhead lines are supplied from the station by trunk lines, one-half of which are underground through the half-mile circle.

PUBLIC LIGHTING COMMISSION.

35

Comparative Kilowatt Hour Output.

Twelve months to June 30, 1902.

Month.	Arc.	Incand.	Total.
July	226,985	40,118	267,103
August	245,717	43,180	288,897
September	281,105	44,032	325,137
October	336,533	50,320	386,853
November	352,763	56,296	409,059
December	379,051	74,494	453,545
January	378,015	65,722	443,737
February	338,524	67,007	405,531
March	333,469	63,653	397,122
April	289,614	53,906	343,520
May	268,225	46,396	314,621
June	242,254	46,470	288,724
Totals.....	3,672,255	651,594	4,323,849

Twelve months to June 30, 1901.

Month.	Arc.	Incand.	Total.
July	211,355	33,804	245,159
August	247,400	36,234	283,634
September	276,737	36,012	312,749
October	327,436	41,884	369,320
November	345,624	47,046	392,670
December	376,516	47,685	424,201
January	370,298	51,690	421,988
February	307,734	41,464	349,198
March	305,707	44,526	350,233
April	257,182	40,576	297,758
May	236,917	39,348	276,265
June	212,483	37,692	250,175
Totals.....	3,475,389	497,961	3,973,350

Comparative Amount of Coal Consumed.

The total amount of coal consumed during the year, and the same reduced to the number of pounds per kilowatt hour with comparisons is as follows:

Month	Year ending June 30, 1902—		Year to June 30, '91		Year to June 30, '00		Year to June 30, '99		Year to June 30, '98	
	Pounds Coal consumed.	Pounds per Kil. hr.	Pounds per Kil. hr.	Pounds per Kil. hr.	Pounds per Kil. hr.	Pounds per Kil. hr.	Pounds per Kil. hr.	Pounds per Kil. hr.	Pounds per Kil. hr.	Pounds per Kil. hr.
July	1,396,010	5.23	4.72	5.14	5.79	5.53				
August	1,560,270	5.40	4.77	4.78	5.55	5.40				
September	1,633,340	5.02	4.60	4.04	5.30	4.72				
October	1,868,690	4.83	4.65	4.27	5.21	5.07				
November	1,837,250	4.49	4.69	3.98	4.75	4.96				
December	2,062,310	4.55	4.44	3.97	4.64	4.76				
January	1,976,910	4.45	4.40	3.90	4.75	5.42				
February	1,705,000	4.20	4.88	4.17	4.90	5.10				
March	1,781,920	4.49	4.90	4.39	5.17	5.27				
April	1,643,990	4.78	5.09	4.57	5.41	5.24				
May	1,536,850	4.88	5.20	4.66	5.30	5.57				
June	1,463,450	5.07	5.22	4.69	5.58	5.76				
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>				
Totals.....	20,465,990	4.78	4.80	4.38	5.19	5.23				
Year to June 30, Lbs.										
1901	18,926,280									
Year to June 30,										
1900	16,741,070									
Year to June 30,										
1899	18,166,430									
Year to June 30,										
1898	17,075,525									
Year to June 30,										
1897	15,032,230									
Year to June 30,										
1896	13,114,531									

Cost of Coal.

The prices paid per ton of 2,000 lbs. for coal, delivered on Public Lighting Commission side track, weights guaranteed, were:

Year ending June 30, 1896—Jackson Hill Lump.....	\$2.19
Year ending June 30, 1897—Jackson Hill Lump.....	2.12
Year ending June 30, 1898—Jackson Hill Lump.....	1.97
Year ending June 30, 1899—Jackson Hill Lump.....	1.97
Year ending June 30, 1900—Pocahontas Smokeless.....	1.99
Year ending June 30, 1901—West Virginia Lump.....	2.20
Year ending June 30, 1902—Fairr.....	2.0

Inside Wiring Department.

The work of the department having in charge the inspection of inside electrical wiring and apparatus for the year ending June 30, 1902, was as follows:

Month of	Number of Applications for and Permits Issued	Number of Approvals and Certificates Issued	Amount of Fees Collected.	Expenses.
July	251	298	\$ 255.50	\$ 173.60
August	220	173	201.25	172.50
September	289	239	272.25	194.25
October	338	313	307.50	190.50
November	252	239	248.50	189.05
December	218	274	214.50	176.75
January	196	205	189.25	174.00
February	178	209	208.25	174.80
March	238	232	228.00	174.50
April	254	316	248.50	181.80
May	252	223	222.25	192.70
June	200	196	188.00	185.75
Totals.....	2,886	2,917	\$2,783.75	\$2,180.20

Month of	Number of Applications for and Permits Issued.	Number of Approvals and Certificates Issued.	Amount of Fees Collected.	Expenses.
Twelve Months to June 30, 1901.				
July	196	200	\$ 227.05	\$ 168.62
August	211	210	220.25	191.32
September	267	215	236.75	177.22
October	363	342	277.25	195.00
November	294	320	259.00	199.50
December	239	296	352.75	195.92
January	212	199	179.25	205.15
February	184	213	203.25	196.74
March	224	199	215.50	207.77
April	259	234	269.25	178.10
May	253	248	231.50	173.05
June	265	241	229.25	178.25
Totals.....	2,967	2,917	\$2,901.05	\$2,266.64

Employees and Compensation.

The employes of the Public Lighting Commission on June 30, 1902, were as follows:

Executive :	Rate per Year.	Rate per day and 7 days per week.	Rate per day and 6 days per week.
1 Secretary	\$1,500.00	....	....
1 General Superintendent	2,000.00	....	....
1 Assistant General Supt.....	1,500.00	....	....
1 Storekeeper	480.00	....	....
1 Superintendent's Clerk	600.00	....	....
1 Janitor .....	....	....	\$1.60
1 Draughtsman	660.00	....	....
*1 Draughtsman's Helper .....	....	....	1.60
<hr/>			
	8		

Inspection Department:

1 Inspector	\$1,350.00	....	....
1 Permit Clerk	720.00	....	....
<hr/>			
	2		

Station:

1 First Engr. and Machinist ..	\$1,200.00	....	....
2 First Engineers, each.....	....	\$3.00	....
3 Second Engineers, each....	....	2.25	....
7 Firemen, each .....	....	1.75	....
1 Coal Passer .....	....	1.75	....
6 Oilers, each .....	....	1.75	....
*1 Oiler, relief .....	....	1.75	....
1 Handy Man	720.00	....	....
1 Chief Electrician	1,080.00	....	....
2 Operating Electricians, each	....	2.75	....
3 Switch Tenders, each.....	....	1.50	....
8 Laborers, each .....	....	....	1.60
<hr/>			

Employees and Compensation—Continued.

Lighting :	Rate per Year.	Rate per day and 7 days per week.	Rate per day and 6 days per week.
1 Head Trimmer	\$900.00	....	....
19 Trimmers, each .....	....	\$2.00	....
2 Patrolmen, with horse and buggy, each .....	....	3.25	....
1 Patrolman .....	....	....	\$3.25
1 Belle Isle Man.....	900.00	....	....
1 Sub-Station Man .....	....	2.00	....
<hr/>			
	25		

Maintenance and Repairs:

1 Blacksmith .....	....	....	\$2.75
1 Blacksmith's Helper .....	....	....	1.10
1 Carpenter .....	....	....	2.40
1 Painter .....	....	....	2.25
1 Lathe Man .....	....	....	2.75
1 Steam Fitter .....	....	....	2.75
1 Foreman Lamp and Cable Department .....	....	....	2.75
3 Helpers in Lamp Room, each	....	....	2.00
1 Helper in Lamp Room.....	....	....	1.75
1 Helper in Lamp Room.....	....	....	1.60
1 Apprentice in Lamp Room..	....	....	1.10
1 Apprentice in Lamp Room..	....	....	.66 $\frac{2}{3}$
1 Conduit Man .....	....	....	2.75
1 Conduit Helper	1.60
1 Line Foreman	3.00
5 Linemen, each	2.50
1 Line Helper	2.00
1 Ground Man	1.75
<hr/>			

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Total employes, 95.

*Temporary.

One day's work consists of 8 hours, proportionate wages for overtime.
 Employes paid by the yearly rate are allowed no overtime.

Comparative Cash Cost of an Arc Light.

The year's operating expenses can be divided between the arc and the incandescent in proportion to the electrical output. That chargeable to arc lighting would be \$84,154.96, which amount reduced to the cost of an arc lamp for one year shows the following relative figures.

Department.	Wages.	Stores.	Total.
Maintenance	\$ 3.87	\$ 1.86	\$ 5.73
Executive	3.06	.38	3.44
Station	9.08	9.08	18.16
Lighting	7.56	4.53	12.09
Shop Supplies .....	....	.02	.02
Surgeon and Hospital.....	....	.01	.01
 Totals.....	 \$23.57	 \$15.88	 \$39.45

The corresponding figures for the twelve months ending June 30, 1901, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 4.85	\$ 2.95	\$ 7.80
Executive	2.93	.49	3.42
Station	9.21	9.81	19.02
Lighting	7.80	4.41	12.21
Shop Supplies .....	....	.05	.05
Surgeon and Hospital.....	.02	.07	.09
 Totals.....	 \$24.81	 \$17.78	 \$42.59

The corresponding figures for the twelve months ending June 30, 1900, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 4.51	\$ 1.96	\$ 6.47
Executive	3.27	.46	3.73
Station	9.38	8.25	17.63
Trimming	7.33	4.88	12.21
Shop .....	....	.06	.06
Injuries and Damages.....	.06	.14	.20
 Totals.....	 \$24.55	 \$15.75	 \$40.30
Twelve months to June 30, 1899	\$29.98	\$16.48	\$46.46
Twelve months to June 30, 1898	33.27	18.58	51.85
Twelve months to June 30, 1897	43.57	20.62	64.19

Comparison of Operating Disbursement.

The operating disbursements for the year ending June 30, 1902, in the various departments, if partitioned between wages and stores, will show the following division on the basis of each \$100.00 expended:

Department.	Wages.	Stores.	Total.
Maintenance	\$ 9.81	\$ 4.73	\$14.54
Executive	7.75	.96	8.71
Station	23.02	23.01	46.03
Lighting	19.15	11.49	30.64
Shop Supplies .....	....	.06	.06
Surgeon and Hospital.....	....	.02	.02
 Totals.....	 \$59.73	 \$40.27	 \$100.00

The corresponding figures for the twelve months ending June 30, 1901, are as follows:

Department.	Wages.	Stores.	Total.
Maintenance	\$11.38	\$ 6.92	\$18.31
Executive	6.89	1.16	8.05
Station	21.62	23.04	44.66
Trimming	18.29	10.36	28.65
Shop .....	....	.11	.11
Injuries and Damages.....	.05	.17	.22
 Totals.....	 \$58.24	 \$41.76	 \$100.00

The corresponding figures for the twelve months ending June 30, 1900, are:

Department.	Wages.	Stores.	Total.
Maintenance	\$11.18	\$ 4.87	\$16.05
Executive	8.11	1.13	9.24
Station	23.28	20.47	43.75
Trimming	18.21	12.11	30.32
Shop .....	....	.15	.15
Injuries and Damages.....	.16	.33	.49
 Totals.....	 \$60.94	 \$39.06	 \$100.00

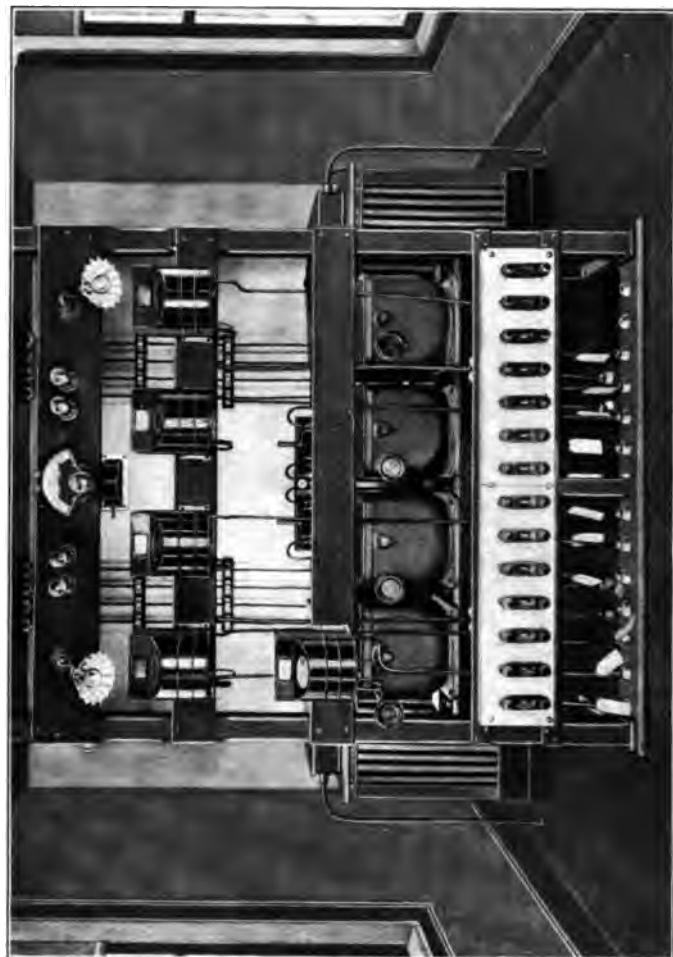
Twelve months to June 30, 1899 \$64.44 \$35.56 \$100.00

Twelve months to June 30, 1898 64.16 35.84 100.00

Twelve months to June 30, 1897 67.89 32.11 100.00



TRANSFORMER HOUSE—BELLE ISLE PARK.



INTERIOR TRANSFORMER HOUSE—BELLE ISLE PARK.

Cash Cost of Operation—July, 1901.

Output this month, 267,103 K. W. hours.

(Output July, 1900, 245,159 K. W. hours.)

Maintenance :	Wages.	Stores.	Total.	Cost per K. W. Hour.
Bldgs., track, dock, etc.....	\$ 62.21	\$ 44.08	\$ 106.29	....
Steam plant	72.81	5.07	77.88	....
Electric plant	34.05	15.42	49.47	....
Miscel. tools and machinery.	67.65	40.68	108.33	....
Conduits	5.95	2.00	7.95	....
Towers and lamp posts.....	14.70	1.12	15.82	....
Arc lamps	38.42	83.96	122.38	....
Lines and cables.....	150.19	5.68	155.87	....
 Total maintenance	<u>\$ 445.98</u>	<u>\$ 198.01</u>	<u>\$ 643.99</u>	<u>.00241</u>
Executive :				
Salary Sec'y and City Elec..	\$ 291.66	....	\$ 291.66	....
Printing and stationery.....	....	\$ 13.46	13.46	....
Store room	76.62	....	76.62	....
Office expense	111.37	9.66	121.03	....
Superintendence and drafting	180.00	1.15	181.15	....
 Total executive	<u>\$ 659.65</u>	<u>\$ 24.27</u>	<u>\$ 683.92</u>	<u>.00256</u>
Station :				
Oils .....	....	\$ 70.43	\$ 70.43	.00026
Waste .....	....	20.44	20.44	.00008
Coal .....	....	1,443.34	1,443.34	.00540
Miscellaneous .....	....	31.96	31.96	.00012
Wages	<u>\$1,775.20</u>	....	<u>1,775.20</u>	<u>.00665</u>
 Total station	<u>\$1,775.20</u>	<u>\$1,566.17</u>	<u>\$3,341.37</u>	<u>.01251</u>
Lighting :				
Trimming and patrolling....	\$1,450.85	\$ 8.00	\$1,458.85	....
Carbons .....	....	546.40	546.40	....
Incand. lamp renewals.....	....	120.41	120.41	....
Incand. lighting expense....	168.88	25.26	194.14	....
Globes and nets.....	....	35.97	35.97	....
Miscellaneous .....	....	.70	.70	....
Belle Isle Park.....	91.45	38.10	129.55	....
 Total lighting	<u>\$1,711.18</u>	<u>\$ 774.84</u>	<u>\$2,486.02</u>	<u>.00931</u>
Shop supplies .....	....	....	....	....
Surgeon and hospital.....	....	....	....	....
 Total operating	<u>\$4,592.01</u>	<u>\$2,563.29</u>	<u>\$7,155.30</u>	<u>.02679</u>
July, 1900, was.....	<u>\$4,887.35</u>	<u>\$2,372.03</u>	<u>\$7,259.38</u>	<u>.02961</u>
July, 1899, was.....	4,159.64	2,144.93	6,404.67	.02743
July, 1898, was.....	5,173.50	2,566.39	7,739.89	.03689
July, 1897, was.....	5,952.55	2,525.20	8,477.75	.04522

Cash Cost of Operation —August, 1901.

Output this month, 288,897 K. W. hours.

(Output August, 1900, 283,634 K. W. hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hr.
Maintenance:				
Bldg., track, docks, etc.....	\$ 72.06	\$ 437.07	\$ 509.13	....
Steam plant	76.56	56.06	132.62	....
Electric plant	31.03	....	31.03	....
Miscel. tools and machinery..	47.07	21.00	68.07	....
Conduits	31.26	....	31.26	....
Towers and lamp posts.....	4.97	....	4.97	....
Arc lamps	120.51	49.10	169.61	....
Lines and cables.....	249.16	44.73	293.89	....
 Total maintenance	 \$ 632.62	 \$ 607.96	 \$1,240.58	 .00430
Executive:				
Salary Sec'y and City Elec..	\$ 291.66	....	\$ 291.66	....
Printing and stationery.....	....	\$ 9.68	9.68	....
Store room	65.41	.94	66.35	....
Office expense	96.84	22.48	119.32	....
Superintendence and drafting	180.00	20.00	200.00	....
 Total executive	 \$ 633.91	 \$ 53.10	 \$ 687.01	 .00238
Station:				
Oils .....	....	\$ 64.61	\$ 64.61	.00022
Waste .....	....	19.89	19.89	.00007
Coal .....	....	1,435.66	1,435.66	.00497
Miscellaneous .....	....	70.78	70.78	.00024
Wages	\$1,882.58	....	1,882.58	.00652
 Total station	 \$1,882.58	 \$1,590.94	 \$3,473.52	 .01202
Lighting:				
Trimming and patrolling....	\$1,447.19	\$ 4.00	\$1,451.19	....
Carbons .....	....	586.58	586.58	....
Incand. lamp renewals.....	....	54.56	54.56	....
Incand. lighting expense....	124.24	12.73	136.97	....
Globes and nets.....	....	72.98	72.98	....
Miscellaneous .....	....	14.00	14.00	....
Belle Isle Park.....	93.71	3.06	96.77	....
 Total lighting	 \$1,665.14	 \$ 747.91	 \$2,413.05	 .00835
Shop supplies .....	....	4.95	4.95	.00002
Surgeon and hospital.....	6.25	3.00	9.25	.00003
 Total operating	 \$4,820.50	 \$3,007.86	 \$7,828.36	 .02710
August, 1900, was.....	\$4,929.71	\$4,082.51	\$9,012.22	.03177
August, 1899, was.....	4,564.43	2,546.77	7,111.20	.02703
August, 1898, was.....	5,223.47	2,885.42	8,108.89	.03287
August, 1897, was.....	5,350.85	2,661.68	8,012.53	.03784

Cash Cost of Operation—September, 1901.

Output this month, 325,137 K. W. hours.
 (Output September, 1900, 312,749 K. W. hours.)

				Cost per
	Wages.	Stores.	Total.	K.W. Hr.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 31.58	\$ 124.61	\$ 156.19	....
Steam plant	54.59	11.77	66.36	....
Electric plant	18.80	....	18.80	....
Miscel. tools and machinery.	50.91	40.40	91.31	....
Conduits	16.37	7.89	24.26	....
Towers and lamp posts.....	21.41	10.59	32.00	....
Arc lamps	120.93	31.21	152.14	....
Lines and cables.....	212.08	60.54	272.62	....
 Total maintenance	 \$ 526.67	 \$ 287.01	 \$ 813.68	 .00250
Executive:				
Salary Sec'y and City Elec..	\$ 291.66	....	\$ 291.66	....
Printing and stationery.....	....	\$ 16.60	16.60	....
Store room	84.88	....	84.88	....
Office expense	73.17	20.09	93.26	....
Engineering and draughting.	180.00	49.43	229.43	....
 Total executive	 \$ 629.71	 \$ 86.12	 \$ 715.83	 .00220
Station:				
Oils .....	....	\$ 66.28	\$ 66.28	.00020
Waste .....	....	18.94	18.94	.00006
Coal .....	....	1,576.17	1,576.17	.00485
Miscellaneous supplies .....	....	70.97	70.97	.00022
Wages	\$1,765.36	....	1,765.36	.00543
 Total station	 \$1,765.36	 \$1,732.36	 \$3,497.72	 .01076
Lighting:				
Trimming and patrolling....	\$1,397.00	\$ 3.15	\$1,400.15	....
Carbons .....	....	639.05	639.05	....
Incand. lamp renewals.....	....	54.17	54.17	....
Incand. lighting expense....	17.23	10.60	27.83	....
Globes and nets.....	....	45.14	45.14	....
Miscellaneous supplies .....	....	5.41	5.41	....
Belle Isle Park.....	78.03	9.37	87.40	....
 Total lighting	 \$1,492.26	 \$ 766.89	 \$2,259.15	 .00695
Shop supplies .....	....	1.22	1.22	.00000
Surgeon and hospital.....	....	7.00	7.00	.00002
 Total operating	 \$4,414.00	 \$2,880.60	 \$7,294.60	 .02243
September, 1900, was.....	\$4,855.76	\$3,377.77	\$8,233.53	.02633
September, 1899, was.....	4,437.81	2,676.14	7,113.95	.02378
September, 1898, was.....	5,089.36	2,775.18	7,864.54	.02833
September, 1897, was.....	5,363.06	3,012.72	8,375.78	.03459

Cash Cost of Operation—October, 1901.

Output this month, 386,853 K. W. hours.
 (Output October, 1900, 369,320 K. W. hours.)

	Wages.	Stores.	Total.	Cost per K.W. Hr.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 95.38	\$ 50.24	\$ 145.62	.....
Steam plant	77.68	19.32	97.00	.....
Electric plant	46.51	1.50	48.01	.....
Miscel. tools and machinery..	34.92	10.08	45.00	.....
Conduits	26.01	7.50	33.51	.....
Towers and lamp posts.....	227.30	31.56	258.86	.....
Arc lamps	177.35	72.33	249.68	.....
Lines and cables.....	242.46	105.23	347.69	.....
 Total maintenance	 \$ 927.61	 \$ 297.76	 \$1,225.37	 .00317
Executive:				
Salary Sec'y and City Elec..	\$ 291.66	....	\$ 291.66	.....
Printing and stationery.....	....	\$ 210.10	210.10	.....
Store room	75.83	....	75.83	....
Office expense	77.46	44.20	121.66	.....
Supt. and draughting.....	180.00	1.10	181.10	.....
 Total executive	 \$ 624.95	 \$ 255.40	 \$ 880.35	 .00227
Station:				
Oils .....	....	\$ 79.78	\$ 79.78	.00021
Waste .....	....	23.28	23.28	.00006
Coal .....	....	1,915.40	1,915.40	.00495
Miscellaneous supplies .....	....	71.76	71.76	.00019
Wages	\$1,923.59	....	1,923.59	.00497
 Total station	 \$1,923.59	 \$2,090.22	 \$4,013.81	 .01038
Lighting:				
Trimming and patrolling...	\$1,446.37	\$ 5.00	\$1,451.37	.....
Carbons .....	....	746.42	746.42	.....
Incand. lamp renewals.....	....	57.99	57.99	.....
Incand. lighting expense....	11.27	.87	12.14	.....
Globes and nets.....	....	61.75	61.75	.....
Miscellaneous supplies .....	....	5.26	5.26	.....
Belle Isle Park.....	90.50	.40	90.90	.....
 Total lighting	 \$1,548.14	 \$ 877.69	 \$2,425.83	 .00627
Shop supplies .....	....	16.09	16.09	.00004
Surgeon and hospital.....	....	....	....	....
 Total operating	 \$5,024.29	 \$3,537.16	 \$8,561.45	 .02213
October, 1900, was.....	\$4,976.17	\$4,359.11	\$9,335.28	.02528
October, 1899, was.....	4,558.39	3,260.89	7,819.28	.02208
October, 1898, was.....	5,536.87	3,244.40	8,781.27	.02698
October, 1897, was.....	5,208.99	3,091.68	8,300.67	.02824

Cash Cost of Operation—November, 1901.

Output this month, 409,059 K. W. hours.
(Output November, 1900, 392,670 K. W. hours.)

	Wages.	Stores.	Total.	Cost per K.W.Hr.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 62.62	\$ 1.00	\$ 63.62	....
Steam plant	122.18	134.65	256.83	....
Electric plant	102.26	2.83	105.09	....
Miscl. tools and machinery.	28.21	10.59	38.80	....
Conduits	26.43	5.38	31.81	....
Towers and lamp posts.....	134.18	17.63	151.81	....
Arc lamps	35.60	34.70	70.30	....
Lines and cables.....	166.59	6.19	172.78	....
Total maintenance	<u>\$ 678.07</u>	<u>\$ 212.97</u>	<u>\$ 891.04</u>	<u>.00217</u>
Executive:				
Salary Sec'y and City Elec..	\$ 291.66	....	\$ 291.66	....
Printing and stationery.....	....	\$ 13.23	13.23	....
Store room	112.69	.25	112.94	....
Office expense	75.50	12.48	87.98	....
Supt. and draughting.....	180.00	3.05	183.05	....
Total executive	<u>\$ 659.85</u>	<u>\$ 29.01</u>	<u>\$ 688.86</u>	<u>.00168</u>
Station:				
Oils .....	....	\$ 76.94	\$ 76.94	.00019
Waste .....	....	19.00	19.00	.00005
Coal .....	....	1,883.18	1,883.18	.00460
Miscellaneous supplies .....	....	68.68	68.68	.00017
Wages	\$1,848.31	....	1,848.31	.00452
Total station	<u>\$1,848.31</u>	<u>\$2,047.80</u>	<u>\$3,896.11</u>	<u>.00953</u>
Lighting:				
Trimming and patrolling...	\$1,397.40	\$ 3.50	\$1,400.90	....
Carbons .....	....	897.66	897.66	....
Incand. lamp renewals.....	....	133.63	133.63	....
Incand. light expense.....	15.35	13.44	28.79	....
Globes and nets.....	....	34.00	34.00	....
Miscellaneous supplies .....	....	9.69	9.69	....
Belle Isle Park	91.44	.30	91.74	....
Total lighting	<u>\$1,504.19</u>	<u>\$1,092.22</u>	<u>\$2,596.41</u>	<u>.00635</u>
Shop supplies .....	....	\$ 4.20	\$ 4.20	.00001
Surgeon and hospital.....	....	....	....	....
Total operating	<u>\$4,690.42</u>	<u>\$3,386.20</u>	<u>\$8,076.62</u>	<u>.01974</u>
November, 1900, was.....	\$4,831.79	\$4,144.43	\$8,976.22	.02286
November, 1899, was.....	4,669.91	3,297.93	7,967.84	.02073
November, 1898, was.....	5,503.55	3,323.44	8,826.99	.02455
November, 1897, was.....	5,125.03	3,265.06	8,390.09	.02490

Cash Cost of Operation—December, 1901.

Output this month, 453,545 K. W. Hours.
Output December, 1900, 424,201 K. W. Hours.

	Wages.	Stores.	Total.	Cost per K.W. Hr.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 58.47	\$ 54.65	\$ 113.12	....
Steam plant	138.14	203.25	341.39	....
Electric plant	31.38	25.67	57.05	....
Misc. tools and machinery....	54.45	2.16	56.61	....
Conduits	47.24	1.62	48.86	....
Towers and lamp posts.....	56.26	20.19	76.45	....
Arc lamps	114.51	43.34	157.85	....
Lines and cables.....	248.32	55.38	303.70	....
 Total maintenance	 \$ 748.77	 \$ 406.26	 \$1,155.03	 .00255
Executive:				
Salary Secy. and City Elec..	\$ 291.66	....	\$ 291.66	....
Printing and stationery.....	....	\$ 4.90	4.90	....
Store room	86.40	....	86.40	....
Office expense	74.00	12.76	86.76	....
Engineering and draughting.	180.00	3.69	183.69	....
 Total executive	 \$ 632.06	 \$ 21.35	 \$ 653.41	 .00144
Station:				
Oils .....	....	\$ 96.27	\$ 96.27	.00021
Waste .....	....	23.33	23.33	.00005
Coal .....	....	2,113.87	2,113.87	.00466
Miscellaneous supplies .....	....	256.89	256.89	.00057
Wages	\$1,965.78	....	1,965.78	.00433
 Total station	 \$1,965.78	 \$2,490.36	 \$4,456.14	 .00982
Lighting:				
Trimming and patrolling....	\$1,476.94	\$ 29.87	\$1,506.81	....
Carbons .....	....	911.20	911.20	....
Incand. lamp renewals.....	....	221.38	221.38	....
Incand. lighting expense....	37.00	58.97	95.97	....
Globes and nets.....	....	62.34	62.34	....
Miscellaneous supplies .....	....	2.85	2.85	....
Belle Isle Park.....	120.04	13.82	133.86	....
 Total lighting	 \$1,633.98	 \$1,300.43	 \$2,934.41	 .00647
Shop supplies .....	....	\$ 7.91	\$ 7.91	.00002
Surgeon and hospital.....	....	....	....	....
 Total operating	 \$4,980.59	 \$4,226.31	 \$9,206.90	 .02030
December, 1900, was.....	\$5,038.88	\$4,038.90	\$9,077.78	.02140
December, 1899, was.....	4,648.81	3,234.26	7,883.07	.01885
December, 1898, was.....	5,783.62	3,195.68	8,979.30	.02323
December, 1897, was.....	5,339.33	3,398.78	8,738.11	.02338

Cash Cost of Operation—January, 1902.

Output this month.....	443,737 K. W. Hours.			
Output January, 1901.....	421,988 K. W. Hours.			
Maintenance:	Wages.	Stores.	Total.	Cost per K.W.Hr.
Bldgs., track, dock, etc.....	\$ 56.81	\$ 20.87	\$.77.68	....
Steam plant	160.58	129.96	290.54	....
Electric plant	41.00	296.71	337.71	....
Misc. tools and machinery...	31.38	20.55	51.93	....
Conduits	52.25	.75	53.00	....
Towers and lamp posts.....	41.57	5.32	46.89	....
Arc lamps	138.51	40.63	179.14	....
Lines and cables.....	189.61	26.09	215.70	....
 Total maintenance	<u>\$ 711.71</u>	<u>\$ 540.88</u>	<u>\$1,252.59</u>	<u>.00282</u>
Executive:				
Salary Sec. and City Elect...\$ 291.66			\$ 291.66	....
Printing and stationery.....	....	\$ 13.40	13.40	....
Store room	101.55	....	101.55	....
Office expense	76.00	7.56	83.56	....
Supt. and Draughting.....	180.00	197.14	377.14	....
 Total executive	<u>\$ 649.21</u>	<u>\$ 218.10</u>	<u>\$ 867.31</u>	<u>.00195</u>
Station :				
Oils .....	....	\$ 96.66	\$ 96.66	.00022
Waste .....	....	21.98	21.98	.00005
Coal .....	....	2,026.33	2,026.33	.00457
Miscellaneous supplies .....	....	72.32	72.32	.00016
Wages	<u>\$2,018.82</u>	....	<u>2,018.82</u>	<u>.00455</u>
 Total station	<u>\$2,018.82</u>	<u>\$2,217.29</u>	<u>\$4,236.11</u>	<u>.00955</u>
Lighting:				
Trimming and patrolling....\$1,488.72	\$ 6.00	\$1,494.72	....
Carbons	898.18	898.18	....
Incand. lamp renewals.....	157.12	157.12	....
Incand. lighting expense....21.93	.55	22.48	....
Globes and nets.....	111.33	111.33	....
Miscellaneous supplies	2.86	2.86	....
Belle Isle Park.....	.50	81.18	....
 Total lighting	<u>\$1,591.33</u>	<u>\$1,176.54</u>	<u>\$2,767.87</u>	<u>.00624</u>
Shop supplies	\$ 6.75	\$ 6.75	....	.00002
Surgeon and hospital.....	2.00	2.00	....	.00000
 Total operating	<u>\$4,971.07</u>	<u>\$4,161.56</u>	<u>\$9,132.63</u>	<u>.02058</u>
January, 1901, was.....\$4,901.01	\$3,869.52	\$8,770.53	....	.02078
January, 1900, was..... 4,776.83	3,344.21	8,121.04	....	.01991
January, 1899, was..... 5,624.41	3,226.30	8,850.71	....	.02316
January, 1898, was..... 5,462.29	3,634.15	9,096.44	....	.02517

Cash Cost of Operation—February, 1902.

Output this month..... 405,531 K. W. Hours.
 Output February, 1901..... 349,198 K. W. Hours.

				Cost per K.W. Hr.
Maintenance:	Wages.	Stores.	Total.	
Bldgs., track, dock, etc.....	\$ 30.64	\$ 6.50	\$ 37.14	....
Steam plant	214.90	507.54	722.44	....
Electric plant	90.35	6.98	97.33	....
Misc tools and machinery....	36.05	12.75	48.80	....
Conduits	31.83	3.79	35.62	....
Towers and lamp posts.....	60.86	5.63	66.49
Arc lamps	105.42	37.30	142.72
Lines and cables.....	278.73	107.19	385.92
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Total maintenance	\$ 848.78	\$ 687.68	\$1,536.46	.00379
Executive:				
Salary Sec. and City Elect..	\$ 291.66	\$ 10.00	\$ 301.66
Printing and stationery.....	....	61.60	61.60	....
Store room	90.80	90.80
Office expense	72.00	7.18	79.18
Supt. and draughting.....	180.00	.95	180.95
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Total executive	\$ 634.46	\$ 79.73	\$ 714.19	.00176
Station:				
Oils	\$ 85.43	\$ 85.43	.00021
Waste	20.30	20.30	.00005
Coal	1,747.62	1,747.62	.00431
Miscellaneous supplies	44.37	44.37	.00011
Wages	\$1,792.17	1,792.17	.00442
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Total station	\$1,792.17	\$1,897.72	\$3,689.89	.00910
Lighting:				
Trimming and patrolling...	\$1,338.71	\$ 10.80	\$1,349.51
Carbons .....	....	818.29	818.29	....
Incand. lamp renewals.....	....	36.58	36.58	....
Incand. lighting expense....	18.06	.88	18.94	....
Globes and nets.....	63.86	63.86
Miscellaneous supplies	4.38	4.38
Belle Isle Park.....	79.77	79.77
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Total lighting	\$1,436.54	\$ 934.79	\$2,371.33	.00585
Shop supplies
Surgeon and hospital.....
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Total operating	\$4,711.95	\$3,599.92	\$8,311.87	.02050
February, 1901, was.....	\$4,496.78	\$3,138.77	\$7,635.55	.02188
February, 1900, was.....	4,370.85	2,985.78	7,329.63	.02163
February, 1899, was.....	5,249.31	2,701.34	7,950.65	.02490
February, 1898, was.....	5,152.92	3,166.43	8,319.35	.02731

Cash Cost of Operation—March, 1902.

Output this month..... 397,122 K. W. Hours.
 Output March, 1901..... 350,233 K. W. Hours.

				Cost per
Maintenance:	Wages.	Stores.	Total.	K.W. Hr.
Bldgs., track, dock, etc.....	\$ 62.71	\$ 6.15	\$ 68.86	....
Steam plant	188.72	141.01	329.73	....
Electric plant	46.90	3.37	50.27	....
Misc. tools and machinery..	78.40	4.64	83.04	....
Conduits	21.75	1.75	23.50	....
Towers and lamp posts.....	96.34	19.60	115.94	....
Arc lamps	119.82	52.96	172.78	....
Lines and cables.....	502.70	84.79	587.49	....
 Total maintenance	\$1,117.34	\$ 314.27	\$1,431.61	.00360
Executive:				
Salary Sec. and City Elect..	\$ 291.66	....	\$ 291.66	....
Printing and stationery.....	....	\$ 10.48	10.48	....
Store room	92.20	....	92.20	....
Office expense	75.80	13.35	89.15	....
Supt. and draughting.....	180.00	6.58	186.58	....
 Total executive	\$ 639.66	\$ 30.41	\$ 670.07	.00167
Station:				
Oils .....	....	\$ 94.24	\$ 94.24	.00024
Waste .....	....	22.99	22.99	.00006
Coal .....	....	1,826.47	1,826.47	.00460
Miscellaneous supplies .....	....	81.62	81.62	.00020
Wages	\$2,016.34	....	2,016.34	.00508
 Total station	\$2,016.34	\$2,025.32	\$4,041.66	.01018
Lighting:				
Trimming and patrolling...	\$1,496.35	\$ 7.25	\$1,503.60	....
Carbons .....	....	810.93	810.93	....
Incand. lamp renewals.....	....	70.01	70.01	....
Incand lighting expense.....	17.62	17.79	35.41	....
Globes and nets.....	....	89.65	89.65	....
Miscellaneous supplies .....	....	4.88	4.88	....
Belle Isle Park.....	85.13	39.38	124.51	....
 Total lighting	\$1,599.10	\$1,039.89	\$2,638.99	.00665
Shop supplies .....	....	....	....	....
Surgeon and hospital.....	....	\$ .45	\$.45	.00001
 Total operating	\$5,372.44	\$3,410.34	\$8,782.78	.02211
March, 1901, was.....	\$4,896.31	\$3,611.13	\$8,507.44	.02429
March, 1900, was.....	4,777.63	3,320.28	8,097.91	.02424
March, 1899, was.....	5,545.67	3,107.43	8,653.10	.02742
March, 1898, was.....	5,678.90	3,444.40	9,123.30	.03050

Cash Cost of Operation—April, 1902.

Output this month..... 343,520 K. W. Hours.
 Output April, 1901..... 297,758 K. W. Hours.

				Cost per
	Wages.	Stores.	Total.	K.W. Hr.
Maintenance:				
Bldgs., track, dock, etc.....	\$ 76.95	\$ 42.43	\$ 119.38	.....
Steam plant	145.59	157.02	302.61	.....
Electric plant	80.41	11.92	92.33	.....
Misc. tools and machinery....	67.44	9.60	77.04	.....
Conduits	18.48	.88	19.36	.....
Towers and lamp posts.....	70.51	5.75	76.26
Arc lamps	166.97	31.23	198.20
Lines and cables.....	368.27	350.60	718.87
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Total maintenance	\$ 994.62	\$ 609.43	\$1,604.05	.00464
Executive:				
Salary Sec. and City Elect....	\$ 291.66	\$ 10.00	\$ 301.66
Printing and stationery.....	.....	10.08	10.08	.....
Store room	75.20	1.20	76.40
Office expense	76.00	10.88	86.88
Supt. and draughting.....	180.00	.50	180.50
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Total executive.....	\$ 622.86	\$ 32.66	\$ 655.52	.00193
Station:				
Oils	\$ 81.21	\$ 81.21	.00024
Waste	21.70	21.70	.00006
Coal	1,685.09	1,685.09	.00491
Miscellaneous supplies.....	36.57	36.57	.00011
Wages	\$1,921.93	1,921.93	.00559
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Total station	\$1,921.93	\$1,824.57	\$3,746.50	.01091
Lighting:				
Trimming and patrolling....	\$1,437.85	\$ 5.60	\$1,443.45
Carbons .....	.....	655.23	655.23	.....
Incand. lamp renewals.....	.....	53.95	53.95	.....
Incand. lighting expense....	18.09	4.27	22.36	.....
Globes and nets.....	130.10	130.10
Miscellaneous supplies	22.50	22.50
Belle Isle Park.....	128.98	4.87	133.85
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Total lighting	\$1,584.92	\$ 876.52	\$2,461.44	.00717
Shop supplies	\$ 7.91	\$ 7.91	.00002
Surgeon and hospital.....
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Total operating	\$5,124.33	\$3,351.09	\$8,475.42	.02467
April, 1901, was.....	\$4,721.13	\$3,067.11	\$7,788.24	.02615
April, 1900, was.....	4,458.19	2,727.78	7,185.97	.02567
April, 1899, was.....	4,898.82	2,656.34	7,555.16	.02916
April, 1898, was.....	5,174.66	2,798.64	7,973.30	.03198

Cash Cost of Operation—May, 1902.

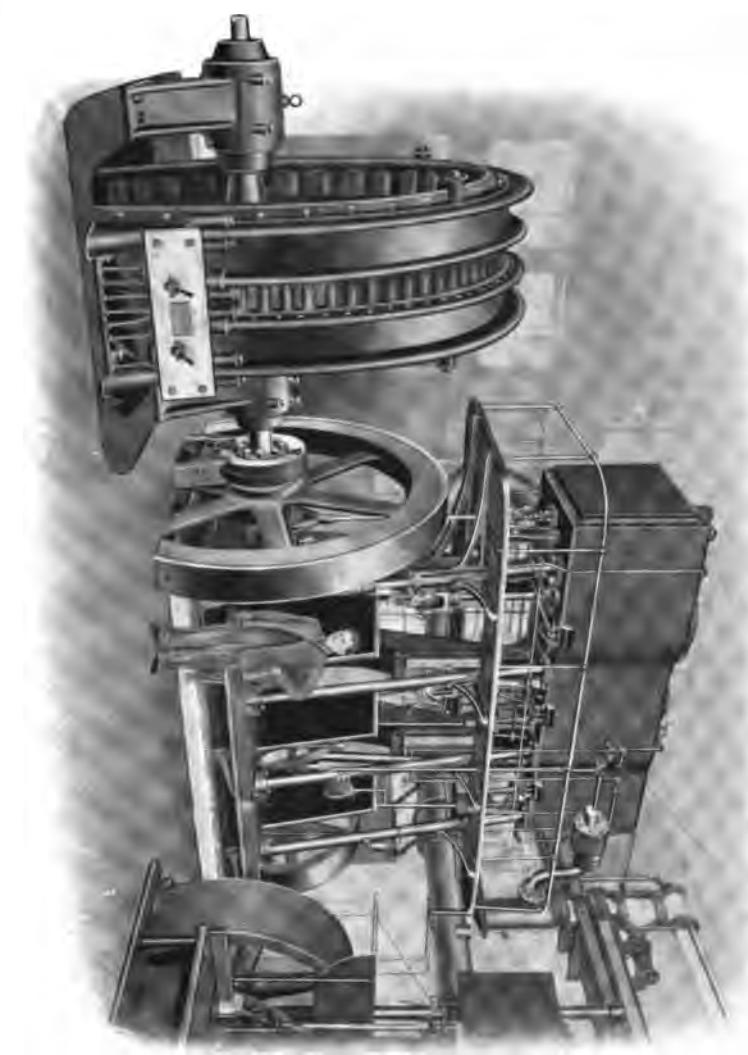
Output this month..... 314,621 K. W. Hours.
 Output May, 1901..... 276,265 K. W. Hours.

				Cost per K.W. Hr.
Maintenance :	Wages.	Stores.	Total.	
Bldgs., track, dock, etc.....	\$ 63.53	\$ 43.19	\$ 106.72	....
Steam plant	143.76	127.06	270.82	....
Electric plant	31.53	....	31.53	....
Misc. tools and machinery...	76.90	9.31	86.21	....
Conduits	33.61	1.25	34.86	....
Towers and lamp posts.....	95.76	7.98	103.74	....
Arc lamps	157.98	34.75	192.73	....
Lines and cables.....	512.28	66.92	579.20	....
 Total maintenance	\$1,115.35	\$ 290.46	\$1,405.81	.00447
Executive :				
Salary Sec. and City Elect..	\$ 291.66	....	\$ 291.66	....
Printing and stationery.....	....	\$ 22.85	22.85	....
Store room	69.20	....	69.20	....
Office expense	76.66	18.80	95.46	....
Supt. and draughting.....	200.80	2.50	203.30	....
 Total executive	\$ 638.32	\$ 44.15	\$ 682.47	.00217
Station :				
Oils .....	....	\$ 67.69	\$ 67.69	.00022
Waste .....	....	22.93	22.93	.00007
Coal .....	....	1,575.27	1,575.27	.00501
Miscellaneous supplies .....	....	31.94	31.94	.00010
Wages	\$1,969.45	....	1,969.45	.00626
 Total station	\$1,969.45	\$1,697.83	\$3,667.28	.01166
Lighting :				
Trimming and patrolling....	\$1,480.49	\$ 13.10	\$1,493.59	....
Carbons .....	....	557.85	557.85	....
Incand. lamp renewals.....	....	102.71	102.71	....
Incand. lighting expense....	34.69	15.06	49.75	....
Globes and nets.....	....	128.51	128.51	....
Miscellaneous supplies .....	....	2.77	2.77	....
Belle Isle Park.....	105.00	2.55	107.55	....
 Total lighting	\$1,620.18	\$ 822.55	\$2,442.73	.00776
Shop supplies .....	....	\$ 2.50	\$ 2.50	.00001
Surgeon and hospital .....	....	1.00	1.00	.00000
 Total operating	\$5,343.30	\$2,858.49	\$8,201.79	.02607
May, 1901, was.....	\$4,828.94	\$2,648.75	\$7,477.69	.02706
May, 1900, was.....	4,514.57	2,804.71	7,319.28	.02904
May, 1899, was.....	4,531.61	2,553.57	7,085.18	.02951
May, 1898, was.....	5,195.46	2,585.75	7,781.21	.03476

Cash Cost of Operation—June, 1902.

Output this month..... 288,724 K. W. Hours.
 Output June, 1901..... 250,175 K. W. Hours.

				Cost per
	Wages.	Stores.	Total. K.W.Hour.	
Maintenance:				
Bldgs., track, dock, etc.....	\$ 64.35	\$ 48.28	\$ 112.63	....
Steam plant	99.76	82.46	182.22	....
Electric plant	21.83	18.60	40.43	....
Misc. tools and machinery....	57.77	15.20	72.97	....
Conduits	33.74	....	33.74	....
Towers and lamp posts....	25.76	25.76
Arc lamps	179.23	30.92	210.15
Lines and cables	485.52	42.93	528.45
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Total maintenance	\$ 967.96	\$ 238.39	\$1,206.35	.00418
Executive:				
Salary Secy. and City Elec..	\$ 291.66	\$ 291.66
Printing and stationery.....	....	57.27	57.27	....
Store room	71.50	71.50
Office expense	75.70	12.75	88.45
Supt. and draughting.....	220.00	6.05	226.05
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Total executive	\$ 658.86	\$ 76.07	\$ 734.93	.00254
Station:				
Oils	\$ 64.27	\$ 64.27	.00022
Waste	21.17	21.17	.00007
Coal	1,462.90	1,462.90	.00507
Miscellaneous supplies	71.74	71.74	.00025
Wages	\$1,926.09	1,926.09	.00667
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Total station	\$1,926.09	\$1,620.08	\$3,546.17	.01228
Lighting:				
Trimming and patrolling...	\$1,4447.12	\$ 7.80	\$1,454.92
Carbons .....	....	534.43	534.43	....
Incand. lamp renewals.....	....	95.02	95.02	....
Incand. lighting expense....	39.12	176.28	215.40	....
Globes and nets.....	122.10	122.10
Miscellaneous supplies	18.28	18.28
Belle Isle Park.....	101.74	25.45	127.19
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Total lighting	\$1,587.98	\$ 979.36	\$2,567.34	.00889
Shop supplies:				
Surgeon and hospital.....	\$ 4.65	\$ 4.65	.00002
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Total operating	\$5,140.89	\$2,918.55	\$8,059.44	.02791
June, 1901, was.....	\$4,326.98	\$2,693.78	\$7,020.76	.02806
June, 1900, was.....	4,728.83	3,005.06	7,733.89	.03449
June, 1899, was.....	4,108.93	2,160.42	6,269.35	.02907
June, 1898, was.....	5,041.76	2,082.89	7,124.65	.03615



1,000 H. P. TRIPLE SAMUEL F. HODGE ENGINE DIRECT CONNECTED TO 600 K. W. STANLEY ALTERNATOR.

Operating**FISCAL YEAR****First Six Months.**

Maintenance :	Wages.	Stores.	Total
Bldgs., track, dock, etc.....	\$ 382.32	\$ 711.65	\$ 1,093.97
Steam plant	541.96	430.12	972.08
Electric plant	264.03	45.42	309.45
Misc. tools and machinery.....	283.21	124.91	408.12
Conduits	153.26	24.39	177.65
Towers and lamp posts.....	458.82	81.09	539.91
Arc lamps	607.32	314.64	921.96
Lines and cables	1,268.80	277.75	1,546.55
 Total maintenance	 \$ 3,959.72	 \$ 2,009.97	 \$ 5,969.69
Executive :			
Salary Secy. and City Elec.....	\$ 1,749.96	....	\$ 1,749.96
Printing and stationery.....	....	\$ 267.97	267.97
Store room	501.83	1.19	503.02
Office expense	508.34	121.67	630.01
Supt. and draughting	1,080.00	78.42	1,158.42
 Total executive	 \$ 3,840.13	 \$ 469.25	 \$ 4,309.38
Station :			
Oils .....	....	\$ 454.31	\$ 454.31
Waste .....	....	124.88	124.88
Coal .....	....	10,367.62	10,367.62
Miscellaneous supplies .....	....	571.04	571.04
Wages	\$11,160.82	....	\$11,160.82
 Total station	 \$11,160.82	 \$11,517.85	 \$22,678.67
Lighting :			
Trimming and patrolling.....	\$ 8,615.75	\$ 53.52	\$ 8,669.27
Carbons .....	....	4,327.31	4,327.31
Incand. lamp renewals.....	....	642.14	642.14
Incand. lighting expense.....	373.97	121.87	495.84
Globes and nets.....	....	312.18	312.18
Miscellaneous supplies .....	....	37.91	37.91
Belle Isle Park.....	565.17	65.05	630.22
 Total lighting	 \$ 9,554.89	 \$ 5,559.98	 \$15,114.87
Shop supplies .....	....	\$ 34.37	\$ 34.37
Surgeon and hospital.....	\$ 6.25	10.00	16.25
 Total operating	 \$28,521.81	 \$19,601.42	 \$48,123.23
Year ending June 30, 1901.....	\$29,519.66	\$22,374.75	\$51,849.41
Year ending June 30, 1900.....	27,270.24	17,029.77	44,300.01
Year ending June 30, 1899.....	32,335.55	17,965.33	50,300.88
Year ending June 30, 1898.....	32,303.34	17,991.59	50,294.93
Year ending June 30, 1897.....	38,830.29	18,605.04	57,435.33

Disbursements.

ENDING JUNE, 30, 1902.

Second Six Months.			Total Twelve Months.		
Wages.	Stores.	Total.	Wages.	Stores.	Total.
\$ 354.99	\$ 167.42	\$ 522.41	\$ 737.31	\$ 879.07	\$ 1,616.38
953.31	1,145.05	2,098.36	1,495.27	1,575.17	3,070.44
312.02	337.58	649.60	576.05	383.00	959.05
347.94	72.05	419.99	631.15	196.96	828.11
191.66	8.42	200.08	344.92	32.81	377.73
390.80	44.28	435.08	849.62	125.37	974.99
867.93	227.79	1,095.72	1,475.25	542.43	2,017.68
2,337.11	678.52	3,015.63	3,605.91	956.27	4,562.18
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\$ 5,755.76	\$ 2,681.11	\$ 8,436.87	\$ 9,715.48	\$ 4,691.08	\$ 14,406.56
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\$ 1,749.96	\$ 20.00	\$ 1,769.96	\$ 3,499.92	\$ 20.00	\$ 3,519.92
....	175.68	175.68	443.65	443.65
500.45	1.20	501.65	1,002.28	2.39	1,004.67
452.16	70.52	522.68	960.50	192.19	1,152.69
1,140.80	213.72	1,354.52	2,220.80	292.14	2,512.94
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\$ 3,843.37	\$ 461.12	\$ 4,324.49	\$ 7,683.50	\$ 950.37	\$ 8,633.87
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....	\$ 489.50	\$ 489.50	\$ 943.81	\$ 943.81
....	131.07	131.07	255.95	255.95
....	10,323.68	10,323.68	20,691.30	20,691.30
....	338.56	338.56	909.60	909.60
\$11,644.80	11,644.80	22,805.62	22,805.62
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\$11,644.80	\$11,282.81	\$22,927.61	\$22,805.62	\$22,800.66	\$45,606.28
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\$ 8,689.24	\$ 50.55	\$ 8,739.79	\$17,304.99	\$ 104.07	\$17,409.06
....	4,274.91	4,274.91	8,602.22	8,602.22
....	515.39	515.39	1,157.53	1,157.53
149.51	214.83	364.34	523.48	336.70	860.18
....	645.55	645.55	957.73	957.73
....	55.67	55.67	93.58	93.58
581.30	72.75	654.05	1,146.47	137.80	1,284.27
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\$ 9,420.05	\$ 5,829.65	\$15,249.70	\$18,974.94	\$11,389.63	\$30,364.57
....	21.81	21.81	\$ 56.18	\$ 56.18
....	3.45	3.45	\$ 6.25	13.45	19.70
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\$30,663.98	\$20,299.95	\$50,963.93	\$59,185.79	\$39,901.37	\$99,087.16
\$28,196.15	\$19,004.06	\$47,200.21	\$57,715.81	\$41,378.81	\$99,094.62
27,626.90	18,160.82	45,787.72	54,879.14	35,190.59	90,087.73
29,958.75	16,405.40	46,364.15	62,294.30	34,370.73	96,665.03
31,705.88	17,991.59	49,418.25	64,009.33	35,703.85	99,713.18
35,920.53	16,785.52	52,706.05	74,750.82	35,390.56	110,141.38

Comparison of Wages Paid in Operating Expenses.

For years ending June 30.

Account.

	1902.	1901.	1900.
Maintenance:			
Buildings, track, wharf, etc....	\$ 737.31	\$ 552.92	\$ 487.10
Steam plant	1,495.27	1,065.07	1,577.95
Electric plant	576.05	595.23	549.45
Miscel. tools, machinery, etc.....	631.15	681.76	780.18
Conduits	344.92	330.32	584.68
Towers and lamp posts.....	849.62	1,335.40	1,047.36
Arc lamps	1,475.25	2,398.44	1,659.00
Lines and cables.....	3,605.91	4,329.53	3,388.93
Total maintenance	\$ 9,715.48	\$11,288.67	\$10,074.65
Executive:			
Salary Sec'y and City Electrician.	\$ 3,499.92	\$ 3,228.89	\$ 3,666.58
Printing and stationery.....	.....	.....	.....
Store room	1,002.28	913.72	963.16
Clerks and office expense.....	960.50	.835.10	1,492.17
Civil engineer and draughting...	2,220.80	1,847.50	1,184.76
Total executive	\$ 7,683.50	\$ 6,825.21	\$ 7,306.67
Station:			
Oils .....	.....	.....	.....
Waste .....	.....	.....	.....
Coal .....	.....	.....	.....
Miscellaneous supplies .....	.....	.....	.....
Wages	\$22,805.62	\$21,421.98	\$20,968.70
Total station	\$22,805.62	\$21,421.98	\$20,968.70
Lighting:			
Trimming and patrolling.....	\$17,304.99	\$16,743.52	\$15,243.86
Carbons .....	.....	.....	.....
Incand. lamp renewals.....	.....	.....	.....
Incand. lighting expense.....	523.48	253.44	252.99
Globes and nets.....	.....	.....	.....
Miscellaneous .....	.....	.....	19.82
Belle Isle Park	1,146.47	1,132.62	880.70
Total lighting	\$18,974.94	\$18,129.58	\$16,397.37
Shop expense .....	.....	.....	.....
Injuries and damages.....	.....	\$ 50.37	\$ 149.75
Total wages paid.....	\$59,179.54	\$57,715.81	\$54,897.14

Comparison of Operating Expenditures for Stores.

Account.	For years ending June 30.	1902.	1901.	1900.
Maintenance :				
Buildings, track, wharf, etc.....	\$ 879.07	\$ 1,164.78	\$ 222.78	
Steam plant	1,575.17	1,488.11	1,034.70	
Electric plant	383.00	821.30	329.92	
Miscl. tools and machinery.....	196.66	293.86	207.58	
Conduits	32.81	69.03	51.01	
Towers and lamp posts.....	125.37	784.07	557.31	
Arc lamps	542.43	712.40	722.49	
Lines and cables.....	956.27	1,521.52	1,260.68	
Total maintenance	<u>\$ 4,691.08</u>	<u>\$ 6,855.07</u>	<u>\$ 4,386.47</u>	
Executive :				
Salary Sec'y and City Elect.....	\$ 20.00	\$ 10.00	\$	
Printing and stationery.....	443.65	854.97	551.84	
Store room	2.39	5.37	6.13	
Clerks and office expense.....	192.19	188.68	341.71	
Civil engr. and draughting.....	292.14	90.75	117.56	
Total executive	<u>\$ 950.37</u>	<u>\$ 1,149.77</u>	<u>\$ 1,017.24</u>	
Station :				
Oils	\$ 943.81	\$ 872.60	\$ 1,024.97	
Waste	255.95	244.37	246.21	
Coal	20,961.30	20,704.44	16,127.59	
Miscellaneous supplies	909.60	1,011.79	1,037.61	
Wages .....	.....	.....	.....
Total station	<u>\$22,800.66</u>	<u>\$22,833.20</u>	<u>\$18,436.38</u>	
Lighting :				
Trimming and patrolling.....	\$ 104.07	\$ 26.75	\$ 191.26	
Carbons	8,602.22	7,833.52	8,017.60	
Incand. lamp renewals.....	1,157.53	1,366.34	1,352.95	
Incand. lighting expense.....	336.70	71.49	176.31	
Globes and nets.....	957.73	693.42	788.91	
Miscellaneous supplies	93.58	173.85	248.16	
Belle Isle Park.....	137.80	98.87	140.29	
Total lighting	<u>\$11,389.63</u>	<u>\$10,264.24</u>	<u>\$10,915.48</u>	
Shop expense	\$ 56.18	\$ 108.38	\$ 136.17	
Injuries and damages.....	13.45	168.15	298.85	
Total supplies	<u>\$39,901.37</u>	<u>\$41,378.81</u>	<u>\$35,190.59</u>	

Comparison of Total Operating Expenses.

Account.	For years ending June 30.		
	1902.	1901.	1900.
Buildings, track, wharf.....	\$ 1,616.38	\$ 1,717.70	\$ 709.88
Steam plant	3,070.44	2,553.18	2,612.65
Electric plant	959.05	1,416.53	879.37
Miscl. tools and machinery.....	828.11	975.62	987.76
Conduits	377.73	399.35	635.69
Towers and lamp posts.....	974.99	2,119.47	1,604.67
Arc lamps	2,017.68	3,110.84	2,381.49
Lines and cables.....	4,562.18	5,851.05	4,649.61
 Total maintenance	 \$14,406.56	 \$18,143.74	 \$14,461.12
 Executive:			
Salary Sec'y and City Elect.....	\$ 3,519.92	\$ 3,238.89	\$ 3,666.58
Printing and stationery.....	443.65	854.97	551.84
Store room	1,004.67	919.09	969.29
Clerks and office expense.....	1,152.69	1,023.78	1,833.88
Civil engr. and draughting.....	2,512.94	1,938.25	1,302.32
 Total executive	 \$ 8,633.87	 \$ 7,974.98	 \$ 8,323.91
 Station:			
Oils	\$ 943.81	\$ 872.60	\$ 1,024.97
Waste	255.95	244.37	246.21
Coal	20,691.30	20,704.44	16,127.59
Miscellaneous supplies	909.60	1,011.79	1,037.61
Wages	22,805.62	21,421.98	20,968.70
 Total station	 \$45,606.28	 \$44,255.18	 \$39,405.08
 Lighting:			
Trimming and patrolling.....	\$17,409.06	\$16,770.27	\$15,435.12
Carbons	8,602.22	7,833.52	8,017.60
Incand. lamp renewals	1,157.53	1,366.34	1,352.95
Incand. lighting expense.....	860.18	324.93	429.30
Globes and nets.....	957.73	693.42	788.91
Miscellaneous supplies	93.58	173.85	267.98
Belle Isle Park.....	1,284.27	1,231.49	1,020.99
 Total lighting	 \$30,364.57	 \$28,393.82	 \$27,312.85
 Shop expense	 \$ 56.18	 \$ 108.38	 \$ 136.17
Injuries and damages.....	19.70	218.52	448.60
 Total operating expense.....	 \$99,087.16	 \$99,094.62	 \$90,087.73

Financial Statement.

April 4th, 1893, to June 30, 1902.
Covering existence of the Commission.

Appropriations and Receipts—

From City of Detroit:

Balance of lighting fund of 1893.....	\$ 8,226.29
From contingent fund, 1893.....	25,000.00
From bond issue, 1893.....	600,000.00
From bond issue, 1896.....	50,000.00
From taxes levied prior to 1893.....	4,379.89
From taxes levied 1893.....	175,000.00
From taxes levied 1894.....	174,362.44
From taxes levied 1895.....	158,278.27
From taxes levied 1896.....	150,000.00
From taxes levied 1897.....	204,780.00
From taxes levied 1898.....	79,000.00
From taxes levied 1899.....	136,945.00
From taxes levied 1900.....	96,000.00
From taxes levied 1901.....	153,328.00

Total from City of Detroit..... \$2,015,299.89

From other sources:

From Inspection Department.....	\$ 15,964.25
From work and material supplied other city departments	21,646.57
From sale of old material.....	5,978.86
From rent conduits, poles, etc.....	8,535.30
From lighting public buildings.....	19,654.28
From accounts payable	14,367.13
From conscience fund	35.00

Total from other sources..... 86,181.39

Grand total appropriations and receipts..... 2,101,481.28

Disbursements—

Investment accounts:

Real estate	\$ 63,125.00
Conduits	97,174.63
Cables	55,744.85
Buildings and wharf.....	110,204.96
Lines and poles.....	173,835.23
Towers and lamp posts.....	97,981.00
Arc plant	71,164.23
Incandescent plant	24,835.24
Steam plant	129,515.34
Railway track and scales.....	10,982.31
Machine shop	8,014.16
Arc lamps and switches.....	65,243.06
Belle Isle	26,412.19

Total amount expended for investment..... 932,232.26

Financial Statement—Continued.**Disbursements—Continued.****Operating expenses:**

City lighting expense from April 4, 1893, to June 30, 1896:	
Office expense	\$ 17,853.51
Advertising	319.16
Public lighting from private companies.....	381,459.72
Fuel	17,162.20
Carbons	8,741.79
Pay rolls	56,178.13
Printing and stationery.....	403.12
General supplies	4,366.37
Oil and rags	1,637.85
Teaning	2,192.60
Incandescent lamps	432.42
Globes and nets.....	676.93
	491,423.80
Operating expenses 12 months to June 30, 1897..	110,141.38
Operating expenses 12 months to June 30, 1898..	99,713.18
Operating expenses 12 months to June 30, 1899..	96,665.03
Operating expenses 12 months to June 30, 1900..	99,087.73
Operating expenses 12 months to June 30, 1901..	99,094.62
Operating expenses 12 months to June 30, 1902..	99,087.16
Cost of labor and material for other city depart- ments	20,330.95
Inspection department	14,085.70
Increase of stores.....	4,011.84
Work on City Hall tower.....	612.38
Work done for Bi-Centennial.....	220.70
Work done for Detroit Boat Club.....	654.08
Accounts receivable	651.48
Taxes charged back, 1893.....\$ 1,487.28	
Taxes charged back, 1894.....	2,525.59
Taxes charged back, 1895.....	3,063.44
Taxes charged back, 1896.....	3,421.58
Taxes charged back, 1897.....	12,469.86
	22,967.75
Total disbursements	\$2,081,979.98
Total appropriations and receipts.....	2,101,481.28
Excess of appropriations and receipts.....	19,501.30
Balance June 30, 1902—	
City Treasurer	\$18,597.03
Secretary	904.27
	\$19,501.30

Receipts and Disbursements.

Twelve Months to June 30, 1902.

Receipts—

From taxes year of 1901 (entire appropriation)	\$153,328.00
From incandescent lighting.	3,564.95
From sale of old material.	452.00
From rentals of poles, conduits, etc.	2,786.53
From inspection department.	2,783.75
From work done for other departments.	7,514.08
From decrease in stores on hand.	62.19
From increase in accounts payable.	10,468.02
 Total receipts	 \$180,959.52

Disbursements—

For 12 months operating expense.	\$ 99,087.16
For 12 months construction expense.	80,577.37
For 12 months inspection department expense.	2,180.20
For 12 months foreign work expense.	7,643.36
For Bi-Centennial celebration.	220.70
For old material expense.	7.00
For rental expense.	20.87
 Total disbursements	 \$189,736.66
 Excess disbursements	 \$8,777.14

Cash balances June 30, 1901, were:

City Treasurer	\$27,279.61
Secretary	998.83
	<hr/>
Cash balances June 30, 1902, should amount to.	28,278.44

Cash balances June 30, 1902, should amount to.

\$19,501.30

Cash balances June 30, 1902, are:

City Treasurer	\$18,597.03
Secretary	904.27
	<hr/>
	\$19,501.30

Trial Balance.

	June 30, 1902.
Detroit Boat Club.....	\$ 654.08
Commercial National Bank.....	651.48
Will F. Conant.....	\$ 110.27
Petty cash	904.27
Appropriation balance	182,238.21
City Treasurer, cash.....	18,597.03
Incandescent lighting	3,564.95
Bi-Centennial celebration	220.70
Sale of old material.....	445.00
Pay rolls	69,973.36
Rentals	2,765.66
Inspection department, disbursements.....	2,180.20
Inspection department, receipts.....	2,783.75

Investment Accounts:

Conduits	\$ 2,791.20
Overhead lines	29,202.16
Towers and lamp posts.....	225.96
Steam plant	16,884.42
Electric plant, arc.....	10,215.11
Electric plant, incandescent.....	11,203.40
Cables	374.70
Arc lamps	9,564.44
Belle Isle plant.....	115.98
	<hr/> 80,577.37

Operating Accounts:

Maintenance:

Bldgs., track, dock, etc.	\$ 1,616.38
Steam plant	3,070.44
Electric plant	959.05
Miscel. tools and machinery.....	828.11
Conduits	377.73
Towers and lamp posts.....	974.99
Arc lamps	2,017.68
Lines and cables.....	4,562.18
	<hr/> 14,406.56

Executive:

Salary Sec'y and City Elect.....	\$ 3,519.92
Printing and stationery.....	443.65
Store room	1,004.67
Office expense	1,152.69
Superintendence and drafting.....	2,512.94
	<hr/> 8,633.87
carried forward....	\$196,798.92
	\$261,891.2

Trial Balance—June 30th, 1902—Continued.

Amounts carried forward.....	\$196,798.92	\$261,881.20
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Station :

Oils	\$ 943.81
Waste	255.95
Coal	20,691.30
Miscellaneous supplies	909.60
Wages	22,805.62
	<hr/>
	45,606.28

Lighting :

Trimming and patrolling.....	\$17,409.06
Carbons	8,602.22
Incandescent lamp renewals.....	1,157.53
Incandescent lighting expense.....	860.18
Globes and nets.....	957.73
Miscellaneous supplies	93.58
Belle Isle plant.....	1,284.27
	<hr/>
	30,364.57
Shop supplies	56.18
Surgeon and hospital.....	19.70
Foreign work, disbursements.....	7,643.36
Foreign work; receipts.....	8,362.79

Supplies in stock :

Carbons	\$ 1,964.68
Coal	554.84
Incandescent lamps	273.01
Oils	61.58
Waste	23.23
Globes and nets.....	767.72
Dynamo brushes	16.78
Transmission ropes	350.00
	<hr/>
	4,011.84
Accounts payable	14,256.86
	<hr/>
	\$284,500.85
	\$284,500.85

Trial Balance.

Books Closed June 30, 1902.

Detroit Boat Club.....	\$ 654.08
Commercial National Bank.....	651.48
Petty cash balance.....	904.27
"Appropriation" balance	\$ 9,732.14
Cash balance, "City Treasurer".....	18,597.03
Will F. Conant.....	110.27
Foreign work balance.....	719.43

Supplies in stock:

Oils	\$ 61.58
Globes and nets.....	767.72
Waste	23.23
Carbons	1,964.68
Coal	554.84
Incandescent lamps	273.01
Trans. ropes	350.00
Dynamo brushes	16.78
	4,011.84
Accounts payable	14,256.86
	\$24,818.70 \$24,818.70

Assets and Liabilities.

June 30, 1902.

Assets—

City Treasurer's cash balance.....	\$18,597.03
Secretary's cash balance.....	904.27
Accounts receivable	4,048.00
Stores on hand.....	4,011.84
Total assets	\$27,561.14
Liabilities—	
Accounts payable	\$14,256.86
Excess of assets.....	\$13,304.28

Office of the Public Lighting Commission.

Detroit, August 25, 1902.

Hon. Hamilton Carhartt,
 President Public Lighting Commission,
 Detroit, Mich.

Dear Sir :—

This is to certify that the disbursement vouchers of the Commission for the fiscal year ending June 30, 1902, have been examined by the Auditing Committee and approved.

HAMILTON CARHARTT,
 JOHN ERHARD,
 Auditing Committee.

Office of the City Treasurer.

Detroit, Mich., July 31, 1902.

Hon. Hamilton Carhartt,
 President Public Lighting Commission,
 Detroit, Mich.

Dear Sir :—

The books of this office show that for the fiscal year ending June 30, 1902, the receipts and disbursements for the account of the Public Lighting Commission have been as follows :

Balance July 1, 1901.....	\$ 27,279.61
Receipts from sundry sources.....	<u>170,518.36</u>

Total	\$197,797.97
Total vouchers paid.....	<u>179,200.94</u>

Balance June 30, 1902.....	\$18,597.03
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Yours respectfully,

WM. B. THOMPSON,
 City Treasurer.

Office of the Public Lighting Commission.

STATE OF MICHIGAN,
 County of Wayne.

ss.

Frank T. Bowler, Secretary of the Public Lighting Commission, being duly sworn, says that the accounts of the Public Lighting Commission have been examined and verified by him from April 4, 1893, to June 30, 1902, and that the statements published herewith are drawn correctly from the books of the Commission.

(Signed) FRANK T. BOWLER.

Subscribed and sworn to before me this 27th day of August, 1902.

J. J. ANGLIN,
 Notary Public, Wayne Co., Mich.

Detroit, Mich., June 30, 1902.

Hon. Hamilton Carhartt,
President Public Lighting Commission,
Detroit, Mich.

Dear Sir:—

I have examined the books of the Commission for the fiscal year ending this date, and find them as follows:

Receipts—

From taxes year of 1901 (entire appropriation)	\$153,328.00
From incandescent lighting	3,564.95
From sale of old material	452.00
From rental of poles, conduits, etc.	2,786.53
From inspection department	2,783.75
From work done for other departments	7,514.08
From decrease in stores on hand	62.19
From increase in accounts payable	<u>10,468.02</u>
Total receipts	\$180,959.52

Disbursements—

For 12 months operating expense	\$ 99,087.16
For 12 months construction expense	80,577.37
For 12 months inspection department expense	2,180.20
For 12 months foreign work expense	7,643.36
For Bi-Centennial celebration	220.70
For old material expense	7.00
For rental expense	<u>20.87</u>
Total disbursements	\$189,736.66
Excess disbursements	<u>\$8,777.14</u>

Cash balances June 30, 1901, were:

City Treasurer	\$27,279.61
Secretary	998.83
	<u>28,278.44</u>

Cash balance June 30, 1902, should amount to. \$19,501.30

Cash balances June 30, 1902, are:

City Treasurer	\$18,597.03
Secretary	904.27
	<u>\$19,501.30</u>

I have the honor to be,

Yours very truly,

FRANCIS J. DUCAT.
City Accountant.

Office of the Public Lighting Commission,
Detroit, Mich., January 30, 1902.

To the Honorable, The Controller, City of Detroit:

Dear Sir:—

Complying with your request of January 13th, 1902, we respectfully submit herewith our estimates of funds that will be required for the operation and extensions of the Public Lighting Plant of the City of Detroit for the fiscal year ending June 30, 1903:

Operating and Maintenance—

Stores:

Buildings, track, dock, etc.....	\$ 500.00
Steam plant	1,500.00
Electric plant	900.00
Miscellaneous tools and machinery.....	300.00
Conduits	100.00
Towers and lamp posts.....	600.00
Arc lamps	800.00
Lines and cables.....	2,000.00
Bonds Secretary and City Electrician.....	20.00
Printing and stationery.....	600.00
Store room	10.00
Office	210.00
Engineering and drafting.....	200.00
Oils	1,000.00
Waste	300.00
Coal	22,500.00
Miscellaneous station expense.....	1,000.00
Trimming and patrolling.....	100.00
Carbons	8,000.00
Incandescent lamp renewals.....	2,500.00
Incandescent lighting expense.....	200.00
Globes and nets.....	700.00
Bags, belts, etc.....	100.00
Belle Isle plant.....	100.00
Shop supplies	150.00
Surgeon and hospital.....	160.00
Four wagons	550.00
	\$ 45,100.00

Wages:

Buildings, track, dock, etc.....	\$ 500.00
Steam plant	1,000.00
Electric plant	600.00
Miscellaneous tools and machinery.....	600.00
Conduits	350.00
Amount carried forward	\$ 3,050.00 \$ 45,100.00

Wages—Continued.

Amount carried forward	\$ 3,050.00	\$ 45,100.00
Towers and lamp posts.....	1,400.00	
Arc lamps	1,400.00	
Lines and cables.....	5,000.00	
Salary Secretary and City Electrician.....	3,500.00	
Store room	1,100.00	
Office	900.00	
Engineering and drafting.....	2,500.00	
Wages	23,000.00	
Trimming and patrolling.....	16,000.00	
Incandescent lighting expense.....	600.00	
Belle Isle plant.....	1,200.00	
Surgeon and hospital.....	50.00	
Relief for operating department.....	2,700.00	
		62,400.00
Total operating and maintenance.....		\$107,500.00

Extensions and improvements—

One pump and condenser.....	\$ 7,500.00
One 200 K. W. alternator.....	8,000.00
400 series alternating enclosed arc lamps.....	10,000.00
Foundation and two panels for new switchboard	1,500.00
Additional Unit—For one 800 horse power engine and one 600 K. W. alternator.....	29,000.00
Incandescent service to 37 city buildings.....	13,700.00
Installing 50 arc lamps in underground circuit	7,500.00
Installing 100 arc lamps on overhead lines....	5,000.00
	\$ 82,200.00
Total	\$189,700.00
Less estimated receipts.....	3,525.00
Appropriation	\$186,175.00

We have the honor to be,

Yours respectfully,

HAMILTON CARHARTT,
JOHN ERHARD,
E. H. McCURDY,
FREDERICK F. INGRAM,
JAMES E. DAVIS,
D. W. SIMONS,
Commissioners.

Office of the City Controller,
Detroit, Mich., June 30, 1902.

To the Honorable,
The Public Lighting Commission.

Gentlemen :—

The Board of Estimates of the City of Detroit, after considering the estimates submitted by the Public Lighting Commission for the operation and maintenance of the present plant, and for the improvements and extensions of the public lighting system, for the fiscal year ending June 30, 1903, granted the following:

For operation and maintenance.....	\$107,500.00
For extensions and improvements.....	82,200.00
<hr/>	
Total	\$189,700.00
Less estimated receipts.....	3,525.00
<hr/>	
Appropriation	\$186,175.00

Respectfully yours,

F. A. BLADES,

City Controller.

APPENDIX.**Public Lighting Act.**

AN ACT to amend an act, entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, by adding a new chapter thereto.

Section 1. The People of the State of Michigan enact, That an act entitled "An act to provide a charter for the city of Detroit, and to repeal all acts and parts of acts in conflict therewith," approved June 7, 1883, be and the same is hereby amended by adding a new chapter thereto to be known as chapter thirteen, to read as follows:

CHAPTER XIII.

Section 1. There shall be a board of commissioners in said city known as the public lighting commission. Said commission shall consist of six members, who shall be appointed by the mayor and approved by the common council. The first appointment of members of this commission shall be made at the next meeting of the common council after this chapter shall have become operative, and the first appointments shall be made for the terms respectively of one, two, three, four, five and six years, and the members so appointed shall hold office until their successors are appointed and shall have qualified. Their successors shall be appointed at the termination of said respective terms for the term of six years. Said commissioners shall take and file in the office of the city clerk the oath of office prescribed for city officers, and shall then enter upon the performance of their duties. They shall appoint their president and secretary, who shall perform the duties usually appertaining to such offices and such as shall be prescribed by said board. The president of said board shall be ex-officio a member of the board of estimates. Said board of commissioners shall have authority to call upon the city surveyor for any services they may require in making maps or diagrams of locations of lights and wires within the city limits, and the city clerk and board of public works shall furnish them such information as they may require for the proper discharge of their duties.

Sec. 2. The said city may contract for the lighting of public buildings, streets, avenues, parks, public grounds and places for any period not exceeding three years. It shall have power to procure lands, and purchase or construct the necessary buildings, engines, dynamos, and other machinery, tools, lamps, lines, conduits, poles, towers and other apparatus and appliances constituting a plant for lighting the said city by electricity or by any other means or system, and if the common council deem it desirable it may purchase towers, poles, wires, lamps and other appliances, and cause lines of wire to be constructed, the use of which it may let to any persons or corporation contracting to light said city. It shall also have power to lay pipes and conduits in the highways, alleys and public places, for gas or electric light wires, and to erect in the highways, alleys and public places, poles, towers, or posts for wires or lamps and to place, construct and maintain the necessary lines of wires, either below or above ground, in the highways, alleys or public places. Provided, That nothing in this act shall be construed as granting said municipality or said board the right to engage in the business of private or commercial lighting.

Sec. 3. If the common council shall determine to contract for lighting, it shall by resolution direct the public lighting commissioners to enter into a contract for lighting said city, either by electricity or by such other means as it may determine, for a period of time to be mentioned in such resolution. It shall thereupon be the duty of said commissioners to prepare specifications and advertise for proposals for a period of not less than five days, and enter into a contract in behalf of said city with the lowest responsible bidder, for lighting said city by such means as are specified in such resolution. Provided, It shall be competent for the commissioners to contract for lighting the public buildings and any part or portion of the city by different means or systems.

Sec. 4. If the common council shall determine that it is advisable to establish a plant for public lighting, to be owned by the city, it may direct said commissioners to purchase the necessary lands, machinery, wires, poles, lamps, towers and other

apparatus and appliances mentioned in the second section of this chapter the cost of which shall not exceed eight hundred thousand dollars. And it shall thereupon be the duties of said commissioners without further approval or confirmation of their contracts by the common council, to carry into effect the authority thereby conferred, and to make the necessary purchase of lands, machinery, engines, tools, lamps, apparatus and appliances, and construct the buildings required and cause to be constructed or laid all necessary conduits and lines of wire below ground, and to erect and construct all necessary poles, towers, posts, lines of wire above ground, which they shall deem necessary or required according to such system or systems as they may deem best for the lighting of said city. (As amended January 17, 1895.)

Sec. 5. The said commissioners may employ an electrical engineer, who shall be known as the city electrician, and such other superintendents, engineers, clerks, agents and subordinates under them as may be necessary to carry into effect the provisions of this chapter, regulate and define their duties and prescribe their compensation.

Before the common council shall direct said commissioners to establish a plant as herein provided, it shall by resolution submit to the electors of said city, to be voted upon by said electors, the question as to whether the authority hereby conferred shall be exercised. The proposition shall be stated upon the ballots to be printed by the election commissioners, in the following form: "For a city lighting plant—Yes," and the same words repeated followed by the word "No;" and any elector may vote for or against said proposition by marking a cross opposite said words "Yes" or "No," respectively. The votes upon said proposition and for and against the same respectively, shall be certified, returned and canvassed by the board of city canvassers in the manner now provided by law for certifying, returning and canvassing votes cast for city officers. And if a majority of the electors voting thereon in said city shall vote in favor of said proposition then the authority hereby conferred may be exercised, otherwise the same shall not be so exercised. Notice shall be given by the city clerk by publication in four or more newspapers of the election to vote upon said proposition at least five days before the election.

Sec. 6. The said commissioners shall have a general supervision and management of all public lighting, and of any plant established by the city, as herein provided for that purpose, and all employees engaged in or about the construction or operation thereof, and shall make the necessary purchase of fuel, tools, supplies, materials, apparatus and appliances required in the operation and management of said plant, without further approval or confirmation of their contracts by the common council: Provided, That the expenditures for the operation and management of said plant shall not exceed in any one year the tax levied for that purpose: And provided further, That after the adoption by them of plans and specifications for the erection of any buildings, the board of public works shall have the immediate supervision or superintendence of construction thereof, and also of the laying of conduits in the public streets, and of the necessary excavation, refilling and repaving caused thereby. (As amended January 17, 1895.)

Sec. 7. The said city may raise by tax the necessary funds to provide for the public lighting and for the purpose of providing for the construction of the public lighting plant, as herein provided, may raise moneys by tax or issue the bonds of said city, payable at such times and in such amount and at such rates of interest as the common council may determine, subject, however, to the approval of the board of estimates as provided by section 4, chapter 8, of act number 488 of the public acts of 1887. It shall also have power to issue bonds in like manner or raise moneys by tax for the purchase or construction of conduits, wires, posts, poles, towers and lamps, for use by any party or parties contracting for the public lighting as herein provided.

Sec. 8. No contract shall be let nor any purchase be made of any lands or property requiring the payment of any money, nor shall any moneys be paid for public lighting in excess of the tax levied for that purpose or of moneys raised by issuing bonds as herein provided.

Sec. 9. The public lighting commissioners shall have the supervision of the construction of all the electric lighting lines of wires in said city whether owned by the city or by other parties, and of all connections made with any building or buildings, and no such wires or lines of wire shall be placed, laid, erected or constructed, nor shall any pole or post or conduit be laid, placed or constructed for such lines, nor any connection made with any building or buildings, except under such general regulations as they from time to time may adopt. They may prescribe the limits of the

district or districts in said city, within which it shall not be lawful to erect poles and train wires for such lines above ground in any street or highway, and they may prescribe or determine the other street or streets in which it may be lawful to erect or construct such lines of wire above ground. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor and shall be punished accordingly.

Sec. 10. The common council shall have power to adopt ordinances not in conflict herewith, to carry out the provisions of this chapter and to regulate the use of electricity for lighting purposes in said city, and the training or using of wires therefor, and to regulate or prohibit the erection of poles in the streets of said city for such wires, or the training thereof.

Sec. 11. Any person who shall cut, break, injure or destroy any building, engine, dynamo or other machinery, or appliances, poles, posts, towers, lamps, wires, or conduits erected, constructed or used for the public lighting of said city, whether owned by the corporation or by any party or parties contracting for the lighting of said city, with intent to prevent or interrupt the lighting of any public building, or any part or portion of said city, shall be deemed guilty of a misdemeanor, and shall be punished therefor by a fine of not less than twenty-five dollars nor more than one thousand dollars, or by imprisonment not exceeding two years, or by both fine and imprisonment in the discretion of the court, and proof that the acts was willful shall be prima facie evidence of such intent.

This act is ordered to take immediate effect.

Approved March 18th, 1893.

General Lighting Ordinance.

A GENERAL ORDINANCE authorizing the granting of permission to construct, maintain and operate poles, conduits, wires or other conductors for the purpose of furnishing electric lighting in the City of Detroit.

It is hereby ordained by the People of the City of Detroit:

Section 1. That any person or corporation carrying on a manufacturing business in the City of Detroit, and having surplus power applicable to the purpose, may apply to and receive a permit from the Public Lighting Commission to lay conduits, erect poles and place thereon or therein wires or other conductors for the purpose of furnishing electric lighting to any person or persons desiring the same, and within the district to be designated in the application to be made for such permit. Said Public Lighting Commission is hereby authorized to grant such permits for the laying of conduits, erection of poles, placing of wires or conductors thereon in the streets, alleys or other highways of the city; subject, however, to the conditions and restrictions imposed by this ordinance, and all other general ordinances now in force or which may hereafter be adopted concerning the same.

Sec. 2. The person or corporation to whom such permit shall be granted shall do no injury to any street, avenue, alley, lane, park or public square, or to any shade trees, or in any manner disturb or interfere with any water or gas pipes, or with any public or private sewer now or hereafter laid or constructed by any authorized person, persons or corporations, or the wires and conduits of any telephone, telegraph or electric lighting or street railway company, or of the police, fire or lighting commission, and shall fully indemnify and save harmless the City of Detroit from any and all claims or damages for which said city might be made or become liable to pay by reason of the construction, maintaining, repairing or operating of said poles, conduits, wires, lamps or other conductors, or any apparatus connected therewith or otherwise arising from the use or possession of the rights and privilege granted, or from any neglect on the part of said corporation or person or its or his employes to comply with any of the ordinances of the City of Detroit, and especially shall indemnify the city against and assume all liability and damages which may arise, come or occur to the City of Detroit from any injury to persons or property from the doing of any work herein mentioned, or the neglect of any person or company or its employes to comply with any ordinance

relative to the use of streets, or other public places, especially as to the putting up of lights or barriers at or around excavations, and the acceptance by the person, persons or corporation of such permit of this ordinance shall be an agreement by it to pay to the City of Detroit any sum of money for which the city may become liable from or by reason of such injury.

Sec. 3. All poles erected under such permit shall be firmly set in the ground next to and within the curbstone, so as to cause the least obstruction, in such manner and of such uniform height, size, color and material as shall be approved or designated by the Public Lighting Commission and the Board of Public Works.

Sec. 4. All operating and conducting mains and wires of any such person, persons or corporation shall be thoroughly and securely insulated with a material of sufficient thickness and durability to protect them from abrasion and other mechanical injury, and impervious to water, to be approved by the Public Lighting Commission, and when laid beneath the surface of the ground, all conduits shall be laid in streets and avenues in a line parallel with the curb line thereof, at such distance from the curbstone, or where the curbstone should be as shall be designated by the Board of Public Works, and to a depth not exceeding two feet. It is especially required that all service wire used by such person, persons or corporation shall be connected only with a main laid in a conduit in the alley or at the side of the street nearest to the building into which it is desired to conduct such service wires.

Sec. 5. At least twenty-four hours before opening or excavating in any street, alley or any public space for the above or for any other purpose, said person, persons or corporation shall notify the Board of Public Works in writing of such desire, stating the place where and the object for which said opening is to be made, and obtain the permit of said board, and in the opening and refilling of all openings and excavations made as aforesaid, the relaying of the pavements and other works necessary to the complete restoration of the streets, pavements, sidewalks or ground to equally good condition as when disturbed, the said person, persons or company or its servants or employes shall be under the supervision of the Board of Public Works or its authorized agents, and shall promptly comply with any order or resolution of said board or its agents, or of the Common Council, in reference thereto. Nor shall any street, avenue or public space be allowed to remain open or incumbered for a longer period than shall be necessary to execute the work for which the same has been opened. And the Board of Public Works or the Common Council may determine the question of such necessity.

The earth removed in making such excavation shall be restored and the pavement be relaid by said person or corporation in as good a condition as before the making of such excavation, and thereafter be maintained in as good condition as the surrounding pavement until the street or alley in each case is repaved. No excavation in any street, alley or public place shall be allowed to remain open or said street, alley or public space be encumbered for a longer period than shall be necessary to execute the work for which the same is made.

The cost of restoring the earth or otherwise, arising from such excavations and the laying of the pavements and repairs thereto, caused by the opening of any such street, alley or public place, shall be paid by said person or corporation, and said work shall be done under the supervision of the Board of Public Works, and the expense of such supervision shall be paid by said company, on presentation of bills, certified by said board, and any expense to which the city shall be put from neglect of said company or its employes in the doing of any work, or the doing of the same in an unworkmanlike manner, of the digging of ditches or holes and erection of poles, or restoring the earth or any excavation, or relaying or replacing of any pavement, shall be paid in like manner by said company on presentation of the bills of cost certified by said board, and it shall be the duty of said person or corporation in each instance to promptly pay all bills for labor and material, supervision, etc., incurred by the Board of Public Works in relaying and restoring any pavement or surface disturbed by said person, persons or corporation, and if said bills, properly certified by the Board of Public Works, remain unpaid for the space of thirty (30) days after the presentation to said person or corporation, it shall be the duty of the Board of Public Works to pay over to the credit of the proper fund the amount of any bills so remaining unpaid from the guaranty money deposited by said person or corporation with said board, and on refusal, neglect or failure by said person, persons or corporation to make such guaranty money good to its full extent as herein first named prior to the next meeting of the Common Council, the Board of Public Works shall report the facts in the case to the Common Council for such action by the latter body as is permitted or deemed proper under the terms of the ordinance.

Sec. 6. The Public Lighting Commission shall have the supervision of the construction of all electric light lines of wires erected in pursuance of the authority hereby granted, and all connections made in any public building or buildings, as provided by chapter 13 of the Charter of the City of Detroit. In the lines of wires or the laying of any conduits as herein provided, said Lighting Commission shall prescribe or determine the street or streets in which it shall be lawful to erect or construct lines of wires above ground, and no person shall erect any pole or train any wire for such lines above ground in any street or highway excepting the same be authorized by such permit.

Any person violating the provisions of this section shall be punished by a fine not exceeding five hundred dollars, and in the imposition of such fine the court may make a further sentence that the offender be imprisoned in the Detroit House of Correction until such fine be paid, provided the term of imprisonment shall not exceed the period of six months.

Sec. 7. Any permit hereby authorized shall not become operative and authorize the construction of any line of wires above ground or the laying of any conduits until the person or company to whom the same may be granted shall have filed with the City Controller a satisfactory bond, to be approved by the Controller, in the sum of twenty thousand dollars, conditioned that the person or corporation to whom such permit is granted will faithfully comply with and perform the terms and conditions of this ordinance; and such person or corporation shall also have deposited and shall keep on deposit with the City Treasurer the sum of two hundred dollars to cover the expense of the replacing of the earth in making the repairs to pavements required to be relaid by such person or company under the provision of this ordinance, and as a guarantee for the prompt payment of any bills for such work presented by the Board of Public Works, such deposit shall be kept good to the amount of two hundred dollars, and on failure to keep the same good to that amount such permit shall become void.

Sec. 8. In addition to all usual and ordinary taxes and general or special assessments for which any such person, persons or corporation shall be liable, he or it shall annually on the first day of July pay to the City of Detroit, as part of the consideration for the rights herein conferred, the annual sum of one dollar for each pole erected and maintained by it, and also the sum of \$5 per annum for each and every mile of wire operated and maintained by it, computation thereof to be based upon each strand of wire, whether above or below the surface of the ground, said sum to be paid to the City of Detroit for the first year or portion of a year within one month after the construction and erection of such poles, and annually thereafter on the first day of July in each and every year in advance. And the bond mentioned above in section 7 shall be further conditioned for the payment of said sums.

Sec. 9. Whenever the Public Lighting Commission shall deem it for the public interest they may require, as a condition to the issuing of any permit, that the wires shall be laid in the public conduits, and if any wires shall be strung on poles along any highway, and public conduits shall afterwards be laid therein, said commission may require the wires so strung upon poles to be taken down and put in the public conduit; and upon any refusal to do so, may remove the same. Said commission may prescribe the terms and conditions upon which the public conduits shall be used for such purpose.

Sec. 10. Any rights acquired under any such permit shall cease whenever the Common Council shall so direct, and all poles and wires shall thereupon be removed at the expense of the person or corporation erecting or controlling the same.

Sec. 11. When any wires erected under any such permit shall interfere with any wires of the Public Lighting Commission, or with any telephone or telegraph wires of the Fire Commission or of the Police Department, the Public Lighting Commission may direct the removal of the same, or such alterations in relation thereto as will obviate or prevent such interference. When any person or corporation shall have erected a pole on any portion of a street, it shall be subject to the condition that the Public Lighting Commission may authorize other persons to whom such permits may be granted, to use such pole already erected, and upon such terms and conditions as the Public Lighting Commission may direct.

Sec. 12. This ordinance shall take immediate effect.

Approved October 17, 1893.

Lighting System Ordinance.

AN ORDINANCE to protect the Public Lighting System.

It is hereby ordained by the People of the City of Detroit:

Section 1. That no person shall cut, break, injure, deface or destroy any building, engine, boiler, dynamo or other machinery or appliances, poles, lamp posts, towers, wires or conduits erected or constructed for the public lighting system of the City of Detroit.

Sec. 2. No person shall open or tamper with any manholes or handholes or any vault or junction box connected with the conduits of the public lighting system, nor shall any person, association, corporation, or company attempt to place or place any wires in said conduits, or upon the poles of said system without permission in writing from the Public Lighting Commission.

Sec. 3. No person, association, corporation or company shall post, paint, impress or in any way affix to any pole connected with the public lighting system of said city, or any box, lamp post, tower, wire or other appliance connected therewith, any placard, sign, notice or announcement of any kind, or cause or allow any kite or other obstruction to become entangled with the wires, or apparatus of said system.

Sec. 4. Any violation of any provision of this ordinance shall be punished by a fine not exceeding one hundred dollars and costs; and in the imposition of any fine the court may make a further sentence that the offender may be imprisoned in the Detroit House of Correction until the payment thereof, for any period not exceeding six months.

Sec. 5. This ordinance shall take immediate effect.

Approved September 17th, 1895.

Public Building Ordinance.

AN ORDINANCE relating to the lighting of public buildings:

It is hereby ordained by the People of the City of Detroit:

Section 1. That the City Hall, Municipal Court building, all Police Stations, Fire Engine Houses, House of Correction, all public school buildings and all other buildings occupied by any of the several boards or commissions forming part of the government of the City of Detroit be and the same are hereby declared to be public buildings.

Sec. 2. It shall be the duty of the Public Lighting Commission to furnish the electrical current required for the proper lighting of all public buildings. Any electric current supplied by the said commission may be used in said building for the driving of ventilating fans or other similar appliances.

Sec. 3. During the remainder of the present fiscal year the expense of furnishing such electrical current shall be paid as heretofore by the Common Council or by the several boards and commissions using the same, but the Public Lighting Commission shall include in their estimates hereafter the expense of such lighting of all public buildings or such of them as the board or commission in charge thereof shall require to be lighted.

Sec. 4. Whenever any new public building shall be constructed it shall be the duty of the board or commission in charge thereof to submit the plans therefor to the Public Lighting Commission, and the said commission shall give such instructions as it may deem proper and necessary to insure the proper and safe wiring of such buildings and to supervise the same.

Approved December 12th, 1895

An Ordinance to Regulate Electric Wiring and the Use of Electricity.

It is hereby ordained by the People of the City of Detroit:

Section 1. The Public Lighting Commission of the City of Detroit shall assume the supervision of the putting in of all electric wiring, connections and apparatus, in or on any building in the City of Detroit, and shall establish rules and regulations to which all electrical equipments hereafter erected or used within the City of Detroit shall conform.

Sec. 2. The Public Lighting Commission may, with the consent of the Common Council, employ a sufficient number of competent electricians, not exceeding three, as inspectors, whose duty it shall be to examine each electrical equipment hereafter erected and make a detailed report of same to said Commission as to whether it is in compliance with the rules and regulations of the Commission, and a record of all such reports made by said inspectors shall be kept on file in the office of said Commission, and when an equipment is found to conform to the rules and regulations adopted, the said Commission shall issue a certificate in duplicate that the terms of this ordinance have been complied with, but no such certificate shall be granted until the equipment is made to conform to the rules prescribed herein, and it shall be unlawful to use any such electrical equipment or to furnish electrical current or currents for the same until certificate has been furnished in accordance with the terms of this ordinance, and the rules and regulations of said Commission.

Sec. 3. No person, firm or corporation, shall equip any building with wiring or apparatus, or make any alteration of, change in, or addition to any electrical wiring or apparatus, without first notifying the Public Lighting Commission in writing and giving a general description of the work to be done, so that ample opportunity for inspection may be had, and receiving a written permit to do the work described, and such equipment, alteration, change or addition shall be done to the satisfaction of the Public Lighting Commission, who shall issue a certificate in like manner as provided in section two herein.

Sec. 4. The Public Lighting Commission shall have the right and power, and it shall be their duty to cause all electrical wires and apparatus in or on any building in the City of Detroit to be inspected from time to time, in order to ascertain whether the electrical wiring or apparatus is in any respect dangerous to life or property, and if any part of said electric wires or apparatus shall be found dangerous to life or property, the Public Lighting Commission shall notify the owners of the building or equipments to cease using the electric current in such dangerous equipments; to have the defects in said equipments repaired within a reasonable time, not exceeding ten days from date of notice. The Public Lighting Commission shall also give notice to the company furnishing the electric current to any such dangerous equipment to cease to supply the same until the defects therein are repaired, and it shall be the duty of such company, immediately upon receipt of such notice, to cease to supply the electric current to any such dangerous equipment until such defects are repaired.

Sec. 5. When, upon application, inspection is made of the wiring or equipment in any building in this city, the company or person installing such equipment shall, before certificate is issued, pay to the Public Lighting Commission, of this city, for such inspection, the following fees:

For 15 lights or less.....	\$ 50
When more than 15 lights, and not more than 25 lights.....	75
When more than 25 lights, and not more than 50 lights.....	1 25
When more than 50 lights, and not more than 100 lights.....	2 00
When more than 100 lights, and not more than 150 lights.....	2 50
When more than 150 lights, and not more than 250 lights.....	4 00
When more than 250 lights, and not more than 500 lights.....	5 00
For each additional light, over 500.....	1 cent each

Miniature incandescent lights, one-half above rates.

WHEN WIRING IS FOR ARC LIGHTS.

For two lights or less.....	50
When more than two lights—each.....	25

When wiring is done for dynamo, electric machines, whether used for motors or generators:

For one K-W, or less.....	\$.50
When more than one K-W, and not more than three K-W.....	1 00
When more than three K-W, and not more than eight K-W.....	1 50
When more than eight K-W, and not more than fifteen K-W.....	2 00
When more than fifteen K-W, and not more than thirty K-W.....	2 50
When more than thirty K-W, and not more than sixty K-W.....	5 00
When more than sixty K-W.....	8 00

For inspection of electrical apparatus for which no fee is herein prescribed, and for the re-inspection of electrical installations, as provided in section 4 hereof, and for the inspection of temporary installations for decorative, advertising or theatrical purposes, the Public Lighting Commission may prescribe a fee of not exceeding seventy-five cents (75c) per hour, for the time actually consumed by each inspector in making the inspection, and it shall be the duty of the Public Lighting Commission to turn all money received under this ordinance into the Public Lighting fund of the City of Detroit.

When a person, firm or corporation shall be found to have intentionally or negligently violated any of the rules and regulations established by the Public Lighting Commission, under this ordinance, or when through any fault of the person, firm or corporation doing the work, it is necessary to make extra inspection of the work, the Public Lighting Commission shall have the power to charge for such extra inspection, a fee not to exceed seventy-five cents per hour for the time actually consumed by each inspector in making the inspection.

Sec. 6. Any person, firm or corporation who shall do or attempt to do electrical construction work whether original work or alterations without giving notice in writing to the Public Lighting Commission, and obtaining a permit to do such work, shall upon conviction thereof be fined in the sum of not less than \$20 nor more than \$100 for each offense, and any person, firm or corporation who shall violate any of the provisions of this ordinance, for which a penalty is not herein otherwise provided, and any occupant or owner of premises where electric wiring or apparatus is used or to be used, who shall refuse to allow, or shall prevent or interfere with any inspector in the discharge of his duties under this ordinance, he or they shall upon conviction for each offense, forfeit and pay a fine of not less than \$5.00 nor more than \$100, in the discretion of the court, and in the imposition of any fine or costs, the court may impose a further sentence that the offender be imprisoned in the Detroit House of Correction until the payment thereof, providing that the terms of such imprisonment shall not exceed three months.

Sec. 7. This ordinance shall not be construed to relieve from or lessen the responsibility of any party owning, operating, controlling or installing any electrical equipment for damages to anyone injured by any defect therein, nor shall the city be held as assuming any such liability by reason of the inspection authorized herein or certificates issued.

Sec. 8. This ordinance shall take effect upon and after August 1, 1896.

Approved July 28, 1896.

Sections 4 and 5 of this ordinance are given as amended by the Common Council on September 10, 1901, to take immediate effect.

An Ordinance to Regulate Electric Wiring and Use of Electricity.

It is hereby ordained by the People of the City of Detroit:

Section 1. That the Public Lighting Commission of the City of Detroit shall annually examine wiremen seeking to engage in that vocation (the term wiremen intending to and does hereby designate and refer to those who string, train or place electric wire on the inside of buildings, and not to apply to linemen, or those engaged in stringing, training or placing wire on the outside of buildings or structures), as to their ability to do such electrical work, upon written application for, and who apply in person for examination, and to such as pass said examination to the satisfac-

tion of the Public Lighting Commission, a permit in accordance therewith shall be issued by the said Lighting Commission; said permit shall be issued in the form of a badge, which said badge shall be worn in a conspicuous place on the person of such wireman or electrical worker while he is engaged in doing any manner of electric wiring or while engaged in making repairs to electrical wire or fixtures in any building or structure in said City of Detroit. And it shall be unlawful for any person to engage in doing any manner of electrical wiring or repairs to electric wire or fixtures, in any building without such badge conspicuously displayed on his person while engaged in such work. Any wireman or electrical worker (not including linemen) who fails to conform in every respect to the rules prescribed by this ordinance, or who loans or transfers his badge to another, does thereby revoke his permit, and it shall be the duty of the inspector of the Public Lighting Commission to take up and suspend said person to whom said badge has been issued and report same to the Public Lighting Commission, who shall give said person a hearing, and it shall be optional with the said commission to renew or revoke the said permit until the provisions of this ordinance are complied with.

Sec. 2. It shall be unlawful for any individual, firm or corporation to string or place any bare grounded wire, such as telegraph or telephone wires, on the same pole, stanchion or upright, with high potential wires, without separating said wires carrying high potential currents from said bare grounded wires by a distance of at least eight feet in the clear. And it shall be the duty of any individual, firm or corporation, quasi municipal or otherwise, to remove said bare wires to conform to this ordinance as herein provided, within ninety days from date of service of notice to separate said wires given by the Public Lighting Commission or its duly appointed agent. High potential wires in this ordinance being wires carrying currents of three hundred volts or over.

Sec. 3. It shall be unlawful for any individual, firm or corporation to encase, cover or introduce any wire, carrying electrical current into any iron pipe or any metallic electrical conducting material, affixed to any wooden pole, stanchion or upright, which shall extend nearer than eight feet from the lowest cross-arm on said wooden pole, stanchion or upright; and it shall be unlawful to expose any electrical wire without such insulation in any manner which shall form a connection or circuit with the earth in such manner as to be dangerous or injurious to life or health. This provision not to apply or prevent the encasement of said wires in any non-conducting substance or material such as wood, etc.

Sec. 4. It shall be the duty of any company stringing bare wires wherever said wires cross trolley wires, to provide safe and suitable insulation for all such bare wires at such crossings where in case of breakage said wires would come in contact with the aforesaid trolley wires.

Sec. 5. It shall be the duty of the Public Lighting Commission, upon complaint of any citizen, to examine or cause to be examined any dangerously exposed electrical wires, and to notify the individual, firm or corporation owning or controlling the said exposed wire of its dangerous condition, and to have the same remedied at once, and made safe, and upon the failure of such individual, firm or corporation to remedy and make safe said dangerously exposed wire, it shall be the duty of the said Public Lighting Commission to cause a complaint to be made for a breach of this ordinance and to prosecute the said individual, firm or corporation for such breach; and any refusal or neglect to remedy said dangerously exposed wire, after due and proper notice from the said Lighting Commission, shall subject the individual, firm or corporation owning or controlling the same to a fine or imprisonment.

Sec. 6. All day circuits, excepting street railway circuits, of high potential currents shall be designated by some mark or distinctive insulator upon each wire at each insulator designate the same as such.

Sec. 7. It shall be the duty of any individual, firm or corporation to remove from any building, structure or pole all dead wires, which are not actually in use, within thirty days from notice given by the Public Lighting Commission.

Any breach of this ordinance shall subject the offender to a fine of not exceeding two hundred dollars, or to imprisonment for a period of not exceeding sixty days, and each subsequent breach of this ordinance shall be deemed a separate offense, and shall be so punishable.

Sec. 8. This ordinance shall take immediate effect.

Approved November 1st, 1898.

AN ORDINANCE to regulate the use of wires for telegraph, telephone and electric lighting and all other service wires in the City of Detroit.

It is hereby ordained by the people of the City of Detroit:

Section 1. Any person or corporation may apply to and receive a permit from the Public Lighting Commission, to lay conduits, erect poles and place thereon or therein wires or other conductors for the purpose of furnishing telephone, telegraph and electric lighting or other service wires to any person or persons desiring the same, and within the district to be designated in the application to be made for such permit. Said Public Lighting Commission is hereby authorized to grant such permits for the laying of conduits, erection of poles, placing of wires therein or thereon in the streets, alleys or other public places in the city, subject, however, to the conditions and restrictions imposed by this ordinance and all other general ordinances now in force or which may hereafter be adopted concerning the same.

Sec. 2. The person or corporation, to whom such permit shall be granted, shall do no injury to any street, avenue, alley, lane, park or public square or to any shade trees, or in any manner disturb or interfere with any water or gas pipes or with any public or private sewer now or hereafter laid or constructed by any authorized person, persons or corporations or the wires and conduits of any telephone, telegraph or electric lighting or street railway company or of the Police, Fire, or Lighting Commissions, and shall fully indemnify and save harmless the City of Detroit from any and all claims or damages for which said city might be made or become liable to pay by reason of the construction, maintaining or repairing or operating of said poles, conduits, wires or other conductors, or any apparatus connected therewith or otherwise arising from the use or the possession of the rights and privileges granted or from any neglect on the part of said corporation or person or its or his employes to comply with any of the ordinances of the City of Detroit, and especially shall indemnify the city against and assume all liabilities and damages which may arise, come or occur to the City of Detroit from any injury to persons or property from the doing of any work herein mentioned, or the neglect of any person, or company, or its employes, to comply with any ordinance relative to the use of streets or other public places, especially as to the putting up of lights or barriers at or around excavations and the acceptance by the person, persons or corporations of such permit of this ordinance shall be an agreement by it to pay to the City of Detroit any sum of money for which the city may become liable from or by reason of such injury.

Sec. 3. All poles erected under such permit shall be firmly set in the ground and in streets next to and within the curbstone, so as to cause the least obstruction in such manner, and of such uniform height, size, color and material as shall be approved by the Public Lighting Commission and the Board of Public Works; the number of cross-arms, minimum distances same from the surface of the street, the proximity of different wires to each other, their arrangement, including guy wires, etc., to be approved by the Public Lighting Commission.

Sec. 4. All operating and conducting mains and wires of any such person, persons or corporation shall be thoroughly and securely insulated with a material of sufficient thickness and durability to be not easily abraded or injured mechanically, and impervious to water, where deemed necessary by the Public Lighting Commission, and to be approved by the Public Lighting Commission. All conduits shall be laid in streets and avenues in a line parallel with the curb line thereof at such distance from the curbstone, or where the curbstone should be, as shall be designated by the Board of Public Works, and to a depth to be designated by the Board of Public Works. It is especially required that all service wires used by such person, persons or corporation shall be connected only with a main laid in a conduit in the alley or at the side of the street nearest to the building into which it is desired to conduct such service wires.

Sec. 5. At least twenty-four hours before opening or excavating in any street, alley or any public space for the above or for any other purpose, said person, persons or corporation shall notify the Board of Public Works in writing of such desire, stating the place where, and the object for which such opening is to be made, and obtain the permit of said Board, and in the opening and refilling of all openings and excavations made as aforesaid, the relaying of the pavement and other work necessary to the complete restoration of the street, pavement, sidewalks or grounds to equally good condition as when disturbed, the said person, persons or corporation, or its servants

or employes, shall be under the supervision of the Board of Public Works, or its authorized agents, and shall promptly comply with any order or resolution of said Board or its agents, or the Common Council in reference thereto, nor shall any street, avenue or public place be allowed to remain open or incumbered for a longer period than shall be necessary to execute the work for which the same has been opened, and the Board of Public Works, or the Common Council, may determine the question of such necessity.

The earth removed in making such excavation shall be restored and the pavement be relaid by such person, persons or corporation in as good a condition as before the making of such excavation, and thereafter be maintained in as good a condition as the surrounding pavement, until the street or alley in each case is repaved. No excavation in any street, or alley or public place shall be allowed to remain open, or said street, alley or public place be incumbered for a longer period than it shall be necessary to execute the work for which the same is made.

The cost of restoring the earth or other cost arising from such excavations and the relaying of the pavement, and the repairs thereto caused by the opening of any such street, alley or public place shall be at the expense of said person, persons or corporation, and said work shall be done under the supervision of the Board of Public Works, and the expense of such supervision shall be paid by said company on presentation of bills certified by said board, and any expense to which the city shall be put from the neglect of said company or its employes in the doing of any work, or the doing of the same in any unworkmanlike manner, of the digging of ditches or holes and erection of poles, or restoring the earth or any excavation, or relaying or replacing of any pavement, shall be paid in like manner by said company on presentation of the bill of costs certified by said Board of Public Works. And it shall be the duty of said person, persons or corporation in each instance to promptly pay all bills for labor and material, supervision, etc., incurred by the Board of Public Works in relaying and restoring any pavement or surface disturbed by said person, persons or corporation, and if said bills properly certified by the Board of Public Works remain unpaid for the space of thirty (30) days after the presentation to said person, persons or corporation, it shall be the duty of the Board of Public Works to pay over to the credit of the proper fund the amount of any bills so remaining unpaid from the guarantee money deposited by said person, persons or corporation with said Board, and on refusal, neglect or failure by such person, persons or corporation to make such guaranty money good to its full extent as herein first named, prior to the next meeting of the Common Council, the Board of Public Works shall report the facts in the case to the Common Council for such action by the latter body as is permitted or deemed proper under the terms of the ordinance.

Sec. 6. The Public Lighting Commission shall have the supervision of the construction of all lines of wire erected in pursuance of the authority hereby granted, and all connections made with any building or buildings. In the stringing of line of wires or the laying of any conduits as herein provided, said Lighting Commission shall prescribe and determine the street or streets in which it shall be lawful to erect or construct lines of wires above ground and lay conduits in the ground, and no person shall erect any pole or train any wire for such lines above or in the ground in any street, alley or highway, excepting the same be authorized by such permit. Any person violating the provisions of this section shall be punished by a fine not exceeding five hundred dollars, and in the imposition of such fine the court may make a further sentence that the offender be imprisoned in the Detroit House of Correction until such fine be paid; provided, the term of imprisonment shall not exceed the period of six months.

Sec. 7. Any permit hereby authorized shall not become operative and authorize the construction of any line of wires above ground, or the laying of any conduits until the person, persons or corporation to whom the same may be granted, shall have filed with the City Controller a satisfactory bond, to be approved by the Controller, in the sum of twenty-five thousand dollars (\$25,000), conditioned that the person, persons or corporation to whom such permit is granted will faithfully comply with and perform the terms and conditions of this ordinance, and such person or corporation shall also have deposited and shall keep on deposit with the City Treasurer the sum of two hundred dollars (\$200.00), to cover the expense of the replacing of the earth in making the repairs to pavements required to be relaid by such person or company under the provisions of this ordinance, and as a guarantee for the prompt payment of any bills for such work presented by the Board of Public Works. Such deposit shall be kept good to the amount of two hundred dollars, and on failure to keep the same good to that amount, such permit shall become void.

Sec. 8. Whenever the Public Lighting Commission shall deem it for the public interest they may require as a condition to the issuing of any permit that the wires shall be laid in the public conduits, and if any wires shall be strung on poles along any highway and public conduits shall afterwards be laid therein, said commission may require the wires so strung upon poles to be taken down and in their stead suitable wires put in the public conduit, and upon any refusal to do so may remove the same. Said commission may prescribe the terms and conditions upon which the public conduits shall be used for such purpose.

Sec. 9. Any rights acquired under any such permit shall cease whenever the Common Council shall so direct, and all poles and wires shall thereupon be removed at the expense of the person, persons or corporation erecting or controlling the same.

Sec. 10. When any wires erected under any such permit shall interfere with any wires of the Public Lighting Commission, or with any telephone or telegraph wires of the Fire Commission or of the Police Department or other public service wires, the Public Lighting Commission may direct the removal of the same, or such alterations in relation thereto as will obviate or prevent such interference. When any person or corporation shall have erected a pole on any portion of the street or alley it shall be subject to the conditions that the Public Lighting Commission may authorize other persons or corporations to whom such permits may be granted to use such pole already erected and upon such terms and conditions as the Public Lighting Commission may direct.

The Public Lighting Commission may require that all poles shall be used to their maximum capacity and the lines thereon so distributed as to obtain such result. The Public Lighting Commission may require any person, persons or corporation occupying a certain right of way with line or lines of poles of insufficient capacity to accommodate the requirements of that locality to replace said poles with such other poles as may be approved by the Public Lighting Commission.

Approved December 3d, 1900.



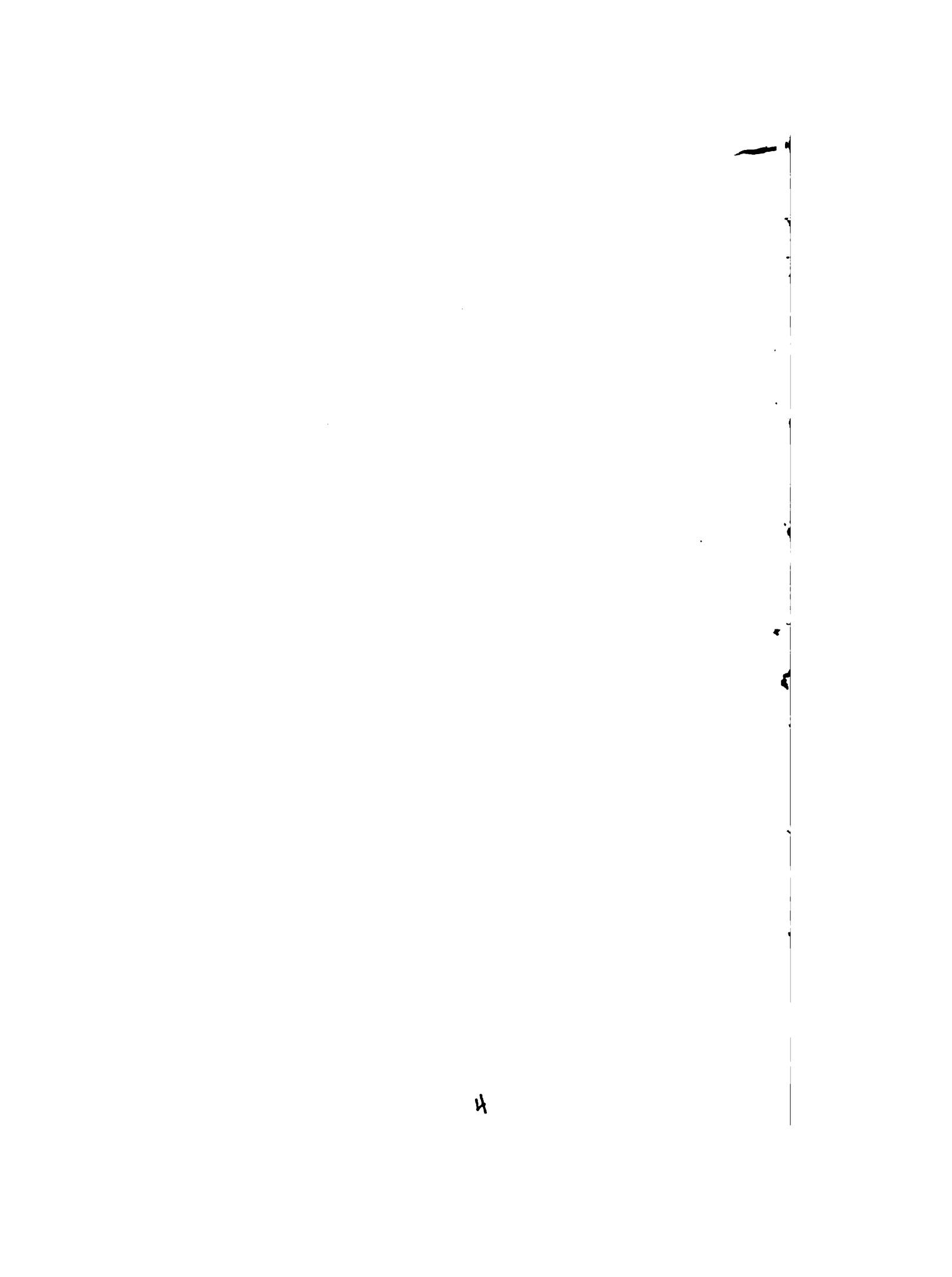
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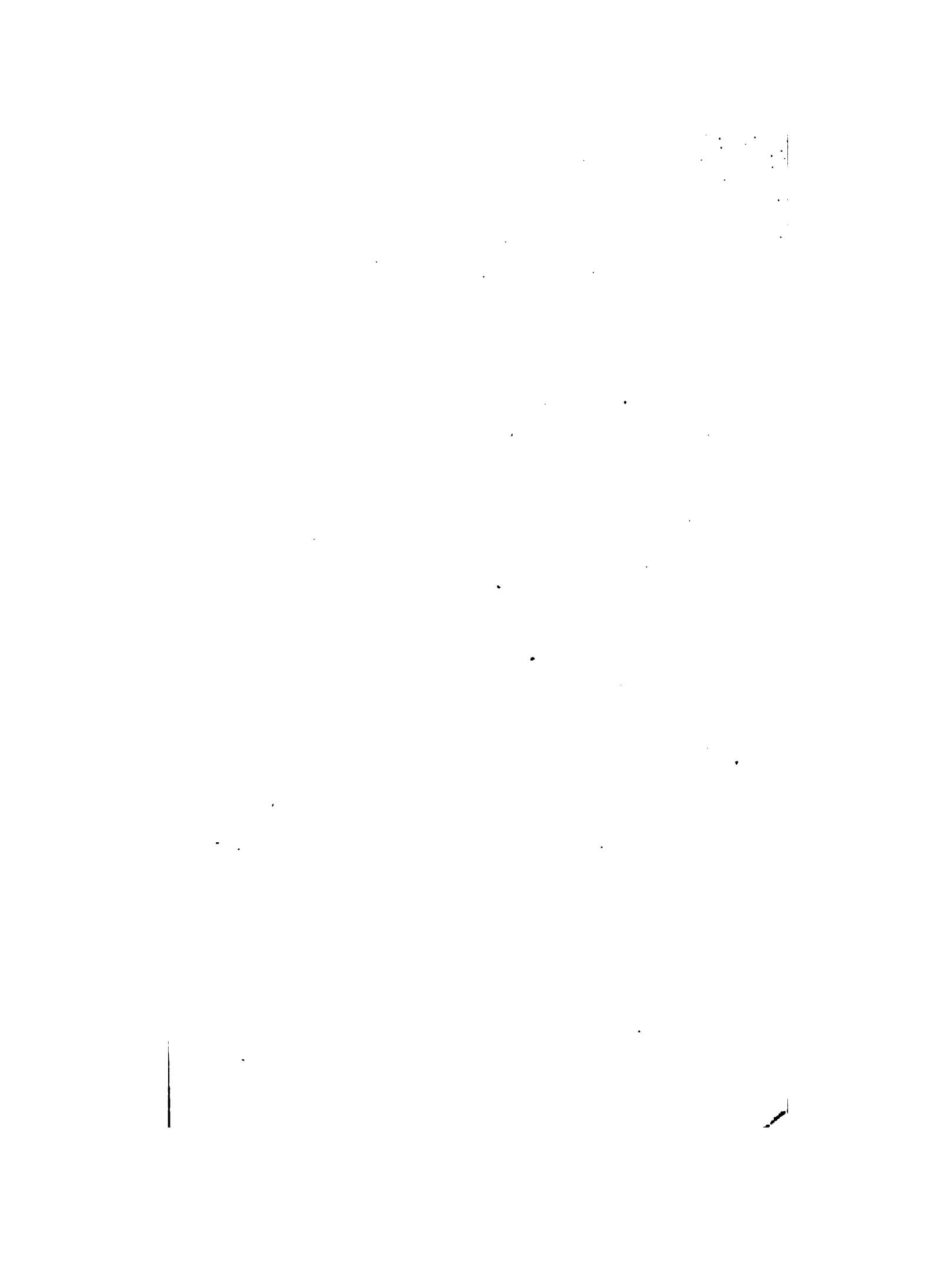
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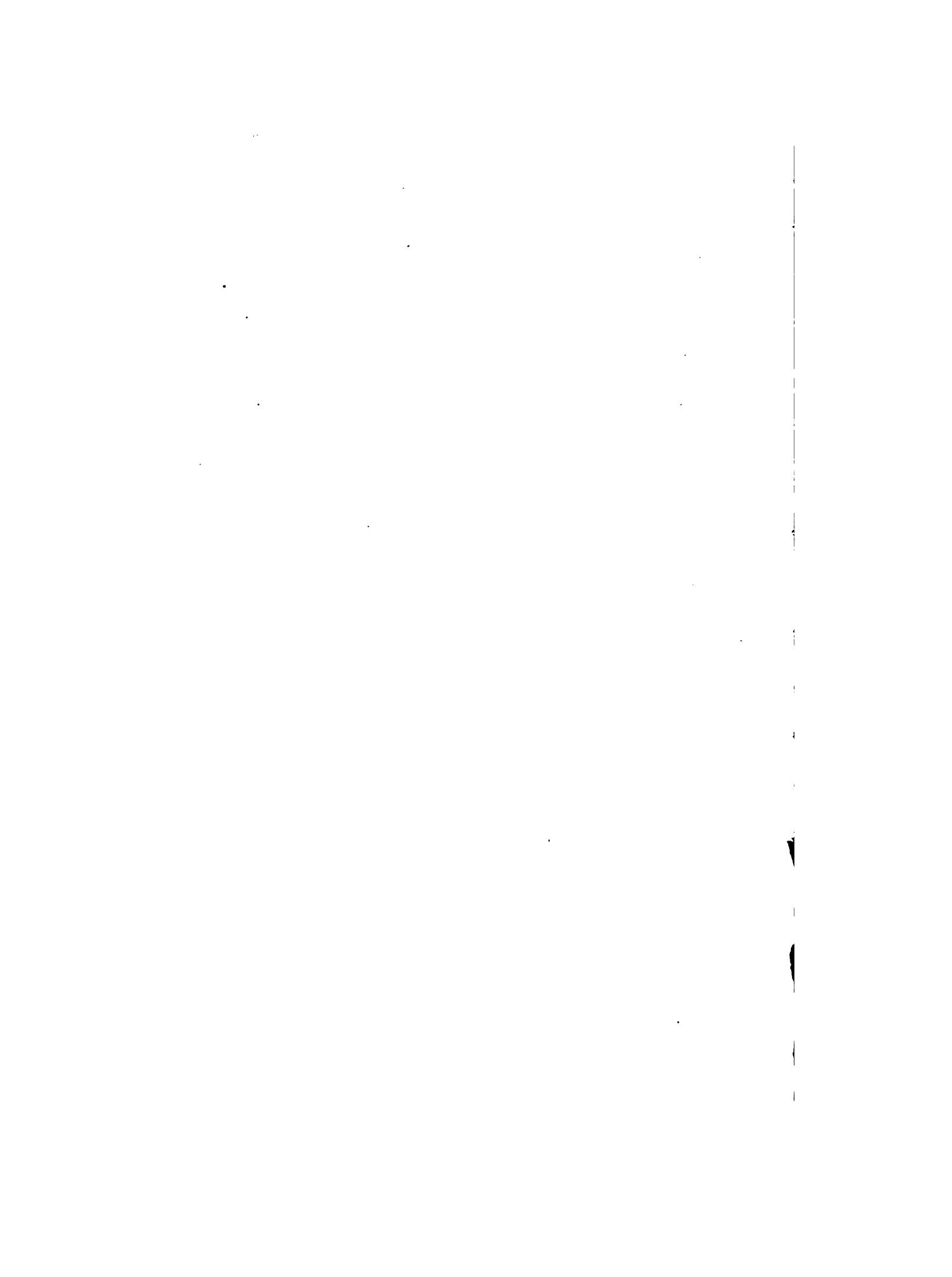
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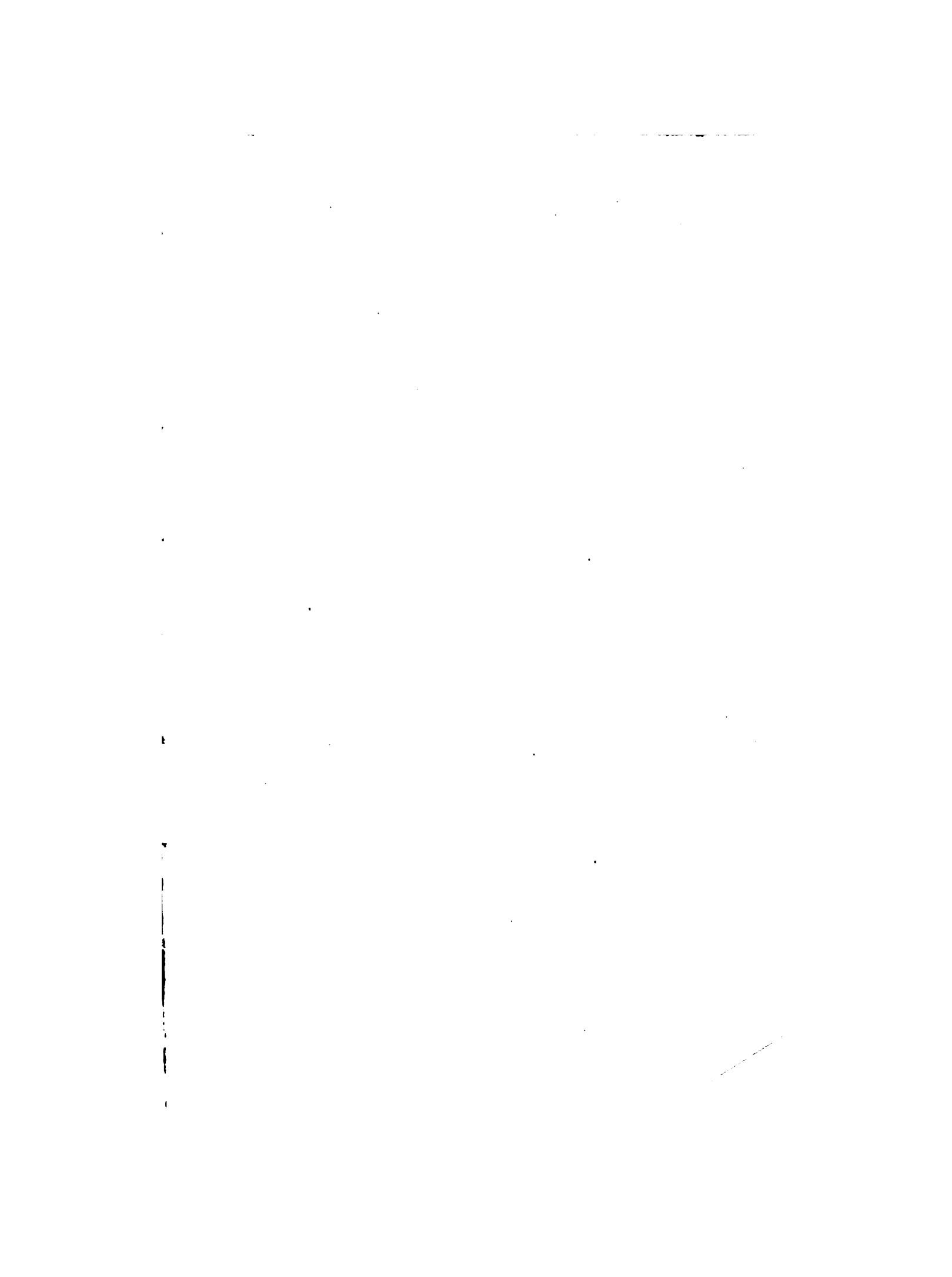


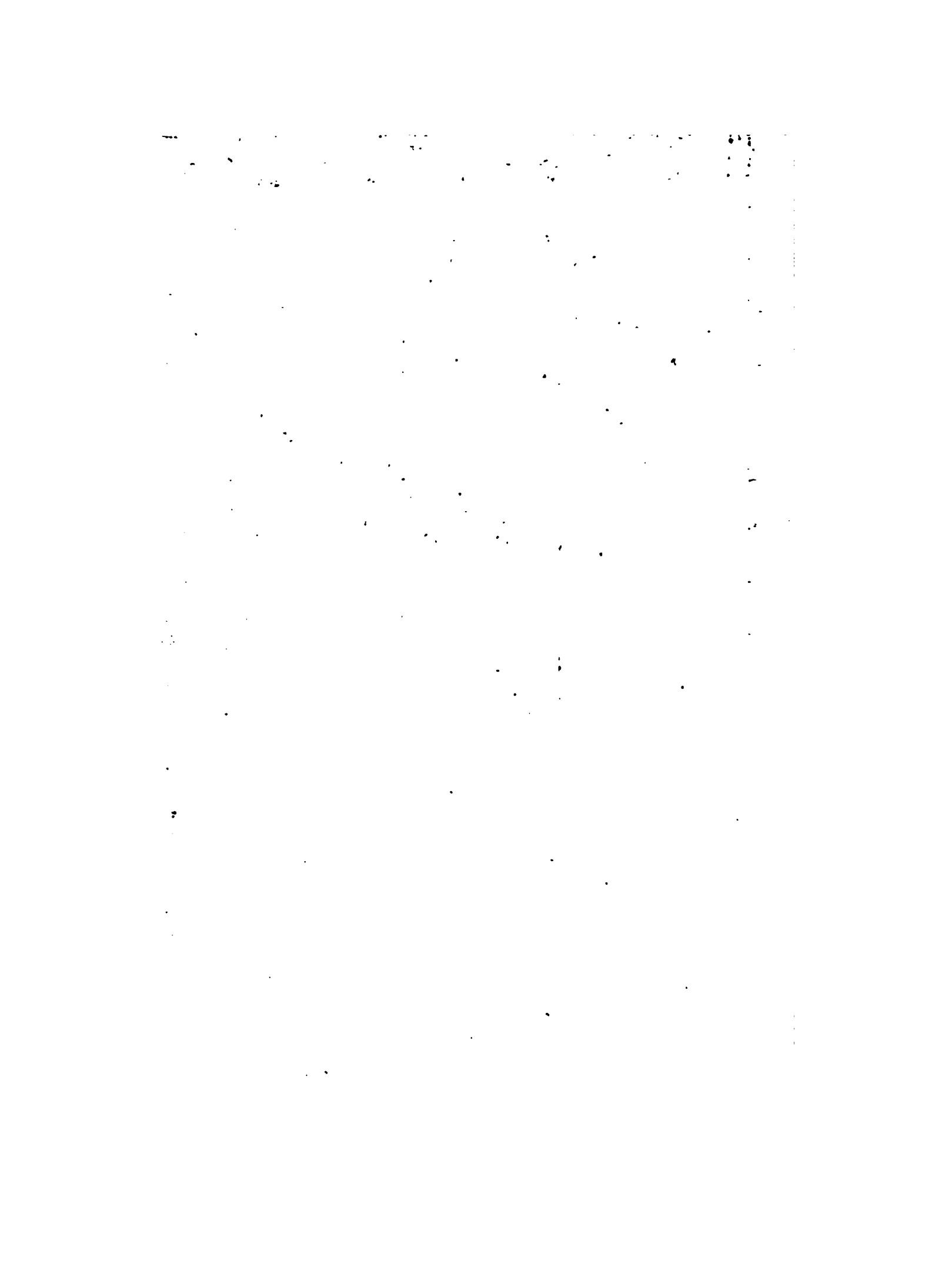














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